THE ENGINEERING AND MINING JOURNAL.

COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LI. MARCH 14. No. 11.

RICHARD P. ROTHWELL, C.E, M.E., Editor.

ROSSITER W. RAYMOND Ph.D., M.E. Special Contributor.

Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Editior.

London: 76 Finsbury Pavement, London, E. C., Mr. Thomas B. Provis, Civil and Mining Engineer, Manager.

Mexico: Mr. R. E. Chism, M. E., Callejon Espiritu Santo No. 4, City of Mexico.

Peru, S. A.: Mr. John Newton, No. 2 Calle Constitucion, Calla.

Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.; Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria; Messrs. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand.

SUBSCRIPTION PRICE, including postage:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5.

Monthly Export Edition, all countries, $2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING CO., Publishers,

SOPHIA BRAEUNLICH, Sec'y & Treas. R. P. ROTHWELL. Pres. and Gen'l Manager.

P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

	PAGE.		PAGE.
Mining as an Investment	319	*Gravity Plane at Moulton Mill Mine, Quebec	325
Price of Aluminum	319	Natural Gas in Iron Making	325
Missouri Geological Survey	319	German Steel Works	325
Standard Steel Rail Sections	319	Review of the Chemical Literature of the Mineral Waxes	326
English Mining Investments	319	*Rice's Friction Clutch Pulley	327
Recent Mine Disasters	320	Manufacture of Basic Steel in 1890	327
New Publications	320	The Nickel and Copper Deposits of Sudbury, Canada	328
The Georgetown Mining District, New Mexico	321	Contribution for Test Suit	328
A New Method for the Production of Pure Oxygen	321	Ocean Temperatures	328
A Peculiar Occurrence of Gold	321	Official Reports	329
Transactions of Engineering Societies	321	Manufacture of Salt in China	329
Treatment of Complex Silver Ores	321	*Johnson's Oil Filter	329
The Highest Inhabited Places	321	Mexico's Exhibit at the World's Fair	329
Ore Supply for Virginia Furnaces.—II.	322	Patents Granted	329
Estimation of Zinc in Ores	322	Personals	330
*Representative American Metallurgists	323	Obituary	330
Some Banket Deposits of the Gold Coast, West Africa	323	Societies	330
		Industrial Notes	330
		Machinery and Supplies Wanted	331

* Illustrated.

MINING NEWS:		Washington	335	MINING STOCK TABLES:	
Alabama	331	Wyoming	335		
Alaska	331			Baltimore	341
Arizona	331	FOREIGN:		Birmingham	341
California	331	Great Britain	335	Boston	343
Colorado	331	Mexico	335	Coal Stocks	343
Florida	332			London	341
Georgia	332	MEETINGS	335	New York	343
Idaho	332	DIVIDENDS	335	Paris	341
Kansas	332	ASSESSMENTS	336	Pittsburg	341
Michigan	332			San Francisco	343
Missouri	334	MINING STOCK MARKETS:		St. Louis	341
Montana	334	New York	336	Trust Stocks	341
Nevada	334	Boston	336		
North Carolina	334	San Francisco	336	MARKETS:	
New Mexico	334	Denver	337	COAL:	
Pennsylvania	335	Lake Superior	337	New York	337
South Carolina	335	St. Louis	337	Boston	338
South Dakota	335	Salt Lake	337	Buffalo	338
Texas	335	Pipe Line	337	Chicago	338
Utah	335			Pittsburg	338
				FREIGHTS	339
				METALS	339
				IRON:	
				New York	339
				Chicago	340
				Cleveland	340
				Louisville	340
				Philadelphia	340
				Pittsburg	340
				CHEMICALS AND MINERALS	344
				BUILDING MATERIAL MARKET	344
				CURRENT PRICES	
				Chemicals	341
				Minerals	341
				Rarer Metals	341
				Building Mat'l	341
				ADV. INDEX	xxi

THE business situation is improving, and there is a probability of important investments being made during the current year in mining. The fact that mining investments when carefully made and honestly administered are more profitable than any other class of investment is becoming better appreciated. If it were not for the wild-cat and inflated schemes that so many people lose their money in, there would be no difficulty in interesting capital in good mining property.

THE reduction in the price of commercially pure aluminum from $2 per pound to $1, which has been announced by the Pittsburg Reduction Company during the past week, marks another step towards a more general employment of this metal in the arts. Although its uses are not so general as has been stated by many writers, there are great possibilities for the metal in the manufacture of many valuable alloys, and the reduction in price will, undoubtedly, lead to an extension of its field of application. The price of the metal below 97 per cent. and above 90 per cent. pure, containing neither sulphur nor phosphorus, which is suitable for alloying with iron and steel, has been further reduced to 90 cents per pound.

THE legislature of Missouri has increased the appropriation for the State Geological Survey for the ensuing year from $20,000, which was the amount asked, to $40,000, thus making the best and most practical testimonial possible to its efficiency and the value attributed to its work Although the survey was organized only in the latter part of 1889, under the able direction of Mr. ARTHUR WINSLOW, the geologist in charge, much important work has been accomplished, although it has necessarily been for the most part of a preliminary nature, no previous information of exact or useful nature upon which to base investigations concerning the geology of the State, being in existence. In 1873-4 Professor BROADHEAD made a partial survey of some portions of the State, but was unable to continue for lack of funds, and this comprised all that had been done up to the time that the present organization took the field.

The mining interests of Missouri are diverse and among the most important of any section of the country, and the work of the State survey will undoubtedly result in the accumulation of much valuable information concerning them. Four bulletins, one of them a bibliography of the geology of the State, have already been issued. With the increased appropriation for the present year, the sphere of activity of the survey will be much widened, and some interesting studies of the geological formations of several important mining districts of the State may be expected.

STANDARD STEEL RAIL SECTIONS.

The Committee of the American Society of Civil Engineers on Standard Rail Sections has made a report of progress, in which it submits ten different sets of designs prepared independently by eleven members of the committee for rails weighing from 40 to 110 pounds per yard. The sections show a fair degree of agreement, considering that they were designed prior to all attempt at comparison of views. The following dimensions represent the figures obtained by taking an average of those proposed by the several members. For all sizes: Top radius, 12 inches; corner radius, $\frac{1}{4}$ inch; vertical sides; lower corner radius, $\frac{1}{16}$ inch; broad head relatively to depth; width of base equal to total height; distribution of metal: head, 42·5 per cent.; neck, 20·9 per cent., and base, 36·6 per cent.; angle of head and top of base, alike, 13 degrees; fillet radius, same for bottom and top of neck, $\frac{1}{4}$ inch; radius of sides of neck—two members recommend 9 inches; four, 12 inches; one, 30 inches; and three recommend straight sides; extremities of base vertical, rounded off, with a very short radius at top and bottom.

Weight of section, pounds per yard	40	50	60	70	80	90	100
Total height, inches	3·58	3·98	4·28	4·62	4·98	5·37	5·47
Width of head, inches	1·94	2·16	2·29	2·43	2·54	2·67	2·73
Depth of head, inches	1·02	1·12	1·27	1·39	1·51	1·60	1·70

The secretary of the committee, Mr. A. M. WELLINGTON, has proposed a set of dimensions averaging as nearly as may be the individual sections, and neglecting any wide deviations which appear in one set of the sections only. These dimensions are as follows: Head, 12-inch radius; top corner, $\frac{1}{4}$-inch; lower corner, $\frac{1}{16}$-inch; vertical sides, percentage of metal, 41·5; neck, 21 per cent. of metal; $\frac{1}{4}$-inch top and bottom fillet radii; sides, either straight or 12-inch radius (there appears to be a division of sentiment on this point); base, 37·5 per cent. of metal; width, same as height of rail; sides, vertical, with $\frac{1}{16}$-inch top and bottom corner radii; angle of head and of top of base, 13 degrees; other dimensions to be as follows:

Weight of rail, pounds per yard	40	50	60	70	80	90	100
Total height and width, inches	3·67	4·	4·33	4·67	5·	5·33	5·67
Width of head, inches	2	2⅛	2¼	2⅜	2½	2⅝	2¾

The further steps of the committee have not yet been determined.

The matter of standard shapes of rail sections has now been a subject of study and discussion for many years. The general form of rail section has long been nearly constant, and the differences in dimensions seem to be rather a matter of individual fancy than of reason. It ought not to be difficult now to secure the consent of a majority of the engineers of the largest railroads and of the rolling mills to a standard set of sections, and we trust the committee will continue the work it has done so well, thus far, and soon bring about the much-desired uniformity.

ENGLISH MINING INVESTMENTS.

Compared with previous years, mining speculation in England was very moderate in 1890. According to the figures in a recent issue of the *Economist*, the number of new mining companies registered in the United Kingdom was 298, the nominal capital of which was £35,187,125, against 378 companies with a capital of £41,015,425 in 1889, and 365 companies and £52,663,400 in the preceding year. The decrease was undoubtedly largely attributable to the falling off in demand for South African gold shares, which suffered a wholesale decline in prices; but there was a general depreciation in nearly all mining stocks, which, with the financial troubles which disturbed the course of business during the year, made it difficult for promoters to place new ventures.

As usual, a large number of the new companies registered in 1890 raised their capital without appealing to the public, the nominal amount offered for general subscription being only £15,500,000, by 61 companies, in comparison with £23,300,000 by 138 companies in the preceding year.

During the year there were a number of reconstructions of old concerns, among them being included several companies operating in this country, the most important of which were the Denver Gold, of Colorado, Emma Silver, of Utah, the Pittsburg Consolidated and Ruby and Dunderberg, of Nevada.

In most of these reconstructions the shareholders were given the option of subscribing to the new capital in sums varying from 10 per cent. to 50 per cent. of their holdings, with the alternative of being paid out by the liquidator, who is usually the reconstructor, also. As a rule, however, the shareholder who cannot or will not increase his risk finds it preferable to sell his shares in the open market, as the value of a mining property without working capital is so doubtful that a liquidator will scarcely assess the shares of a dissentient shareholder at much more than a merely nominal amount. In view of the large number of reconstructions, resulting in loss to shareholders, that are being made every year, the tendency, now becoming marked, to reduce the amount of working capital with which new concerns are started, is bad. Thus, during the past two years, the amount of working capital provided for publicly offered companies has fallen from 25 per cent. of the total to 21 per cent.

In general, recent English investments in American mines have been successful, notably those made in the San Juan district in Colorado. The New Guston and Yankee Girl mines, Cortez, in Nevada, and Elkhorn, in Montana, all recent English investments, have paid large dividends and a percentage ranging from 15 per cent. to 50 per cent. on their average market value during the year.

RECENT MINE DISASTERS.

During the past two months there have occurred a series of the most appalling colliery disasters ever recorded in the history of the coal mining industry in the United States and Nova Scotia. In four mines there have been accidents through which 256 men have lost their lives, 229 deaths having been caused by explosions of fire damp.

At the Mammoth mine of the H. C. Frick Coke Company, in Westmoreland County, Pa., there was an explosion of fire damp on January 27th, which resulted in the death of 107 miners. On February 5th a miner at work in one of the mines of J. C. Hayden & Co., at Jeanesville, Pa., fired a shot which broke through into the old abandoned workings of another mine, filled with water, and in the rush of the latter 17 men were entombed. Four of them were afterward saved, however, in most miraculous manner after an imprisonment of eighteen days. Less than a fortnight after this disaster the Moyer mine, near Scottsdale, Pa., owned by W. J. RAINEY, took fire, its origin being supposed to be incendiary, and 14 men perished. Finally, on February 21st, there was a terrific explosion of fire damp in the Spring Hill mine of the Cumberland Railway and Coal Company, in Nova Scotia, which resulted in the death of 122 men.

In none of these cases have the coroners' juries fixed any blame or accusation of negligence upon the owners or officials in charge of these mines. The Spring Hill Colliery had been examined by one of the deputy inspectors of mines of the province of Nova Scotia only the day before the explosion, and its condition had been found to be excellent. Its ventilation was good, provision was made for sprinkling the coal dust in the gangways and chambers with water, and in general the greatest caution was exercised by the management in the care of the mine and the safety of the workmen employed therein. Every man in the affected portion of this colliery was killed by the explosion and the suffocating after-damp, and its exact cause remains, therefore, a mystery which will probably never be solved.

In the Mammoth mine in Pennsylvania the effects of the explosion in the affected part of the workings were equally terrific, and not a soul survived. In this mine the ventilation was fairly good, but safety lamps were not used, as the workings were supposed to be free from fire damp; the explosion was undoubtedly caused by the ignition of a sudden rush of gas from a portion of the mine where pillars were being drawn, by one of the naked lights.

These terrible calamities have led to a demand for the strengthening of the mining laws of Pennsylvania, and bills authorizing the governor to appoint commissions to revise both the anthracite and bituminous mine laws have already been passed by the Legislature. Both bills are similar and provide for the appointment of commissions, which are to report a new code of laws to the present legislature within thirty-five days of their appointment. It is doubtful, however, whether much more than a recodification of the present laws can be accomplished in this limited time, and after all, the great trouble lies in not enforcing existing laws to their letter. The present mining laws of Pennsylvania are fairly good and if strictly enforced, will reduce the danger in coal mining to very nearly its natural limit.

The Jeanesville disaster has been found to have been caused by reason of an incorrect map of the old workings of the adjoining mine, so that when the breast driven toward them tapped the water, it was supposed that there was a pillar forty feet in thickness between them.

The rescue of the four men imprisoned in this mine is one of the most wonderful in the annals of mining. After the accident every effort was made to unwater the mine as rapidly as possible, but it was only after two weeks of constant pumping that the water was lowered sufficiently to allow a searching party to enter. There was little hope of finding any of the imprisoned men alive at this time, but after thirteen bodies had been found there were still four to be accounted for, and as they were not found at any point reached by the water no time was lost in prosecuting the search for them. They were finally found in a small chamber, living in the midst of such foul air that their existence is a mystery. All of the men, although in extremely weak condition, survived their removal, and, according to reports, have now recovered from the effects of their imprisonment. Similar cases are on record, but none, we believe, where existence was maintained for so long a time under such circumstances.

NEW PUBLICATIONS.

SIXTY YEARS A BRICKMAKER. A Practical Treatise on Brickmaking and Burning. By J. W. Crary, Sr. 122 pages. Illustrated. T. A. Randall & Co., publishers, Indianapolis. Price $2.50.

This book is a disappointment. The purpose of the author, as set forth in his preface, is to supply the long-felt want for a work dealing with the practical questions that may arise in the art of brickmaking. Such a work is, indeed, needed, not only from the fact that bricks form our most important class of material for architectural and engineering construction, but the engineer engaged in work far from manufacturing centers, is frequently called upon to make his own brick. The table of contents of Mr. Crary's book is attractive. All important points have apparently been discussed; as one reads further, however, it is found that these subjects have been treated in anything but a satisfactory manner. The author is too general in his statements, and his discussion is too rambling. One reads the first chapter, on "clays for making bricks," for instance, without deriving any particular information concerning the subject. So it is in many other important portions of the book. In fact, the work can hardly be called a treatise at all, in the ordinary understanding of that term. It is rather a series of reminiscences of Mr. Crary's long business career. It will undoubtedly be of great interest to his friends in the business, but it cannot be called a valuable contribution to technical literature. Nevertheless, it contains considerable useful information of a practical nature, derived from Mr. Crary's long experience, and it is unfortunate that he has not confined himself more closely to his subject.

HANDBOOK OF THE AMERICAN REPUBLICS. Pp. 288. Illustrated. Bureau of the American Republics, publisher, Washington, D. C., 1891.

At the International American Conference, held in Washington from October, 1889, to April, 1890, the establishment of an association under the title of "The International Union of American Republics for the Prompt Collection and Distribution of Commercial Information," to be represented at Washington, under the Supervision of the Secretary of State, by a Bureau of American Republics, was recommended. It was also recommended that this bureau should publish from time to time bulletins containing information that might be useful to producers, merchants, manufacturers and others interested in the development of commerce between the countries of the Western Hemisphere. The hand book, just issued, the first of this series, has been prepared by Mr. William Eleroy Curtis. It contains a list of the delegates to the International Conference and its recommendations, and chapters on the credit systems of Latin America, commerce of the American continents, with many important statistical tables relating to the imports and exports of each country, coinage, weights, and measures, authorized and used in all the countries of North, Central, and South America, an official register, and list of consuls at all ports, postal regulations, cable rates, port charges, and a comprehensive traveler's guide which included list of all steamship lines, with their freight rates and passenger tariffs between all ports of the two hemispheres.

The book is replete with useful information concerning the trade between the United States and South American countries, which is especially valuable at the present time, when the extension of American commerce is likely to take place in those directions through reciprocity treaties, to the establishment of which the present administration is committed.

The Bureau of American Republics has now in preparation a code of nomenclature containing a list of all articles of merchandise imported and exported, with their Spanish and Portuguese equivalents, which it is believed will relieve shippers from serious annoyances and complications. A compilation of the tariff laws of the several South American Republics and a manual of customs regulations have also been proposed.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and that of book buyers, give the retail price?—These notices do not supersede review in another page of the Journal.]

Durability of Brick Pavements. By Ira O. Baker, Professor of Civil Engineering, University of Illinois, 46 pages. Published by T. A. Randall & Co., Indianapolis, Ind., 1891. Price 25 cents.

Electrical Trades' Directory and Hand-Book for 1891. 729 and CXIX pages Illustrated. Published for *The Electrician* Printing and Publishing Company, Ltd., by George Tucker, London, 1891. Price, five shillings.

Geological Survey of Alabama. Report on the Cahaba Coal Field, by Joseph Squire; with an Appendix on the Geology of the Valley Regions Adjacent to the Cahaba Field, by Eugene A. Smith, State Geologist. 189 pages. Illustrations and a Map of the Cahaba Field and Adjacent Regions. Montgomery, Ala. 1890.

Hand Book of the American Republics. Bureau of the American Republics. Bulletin No. 1. 288 pages. Illustrated. Washington, D. C. 1891.

Mines and Minerals of Washington. Annual Report of George A. Bethune First State Geologist. 121 pages. Illustrated. Olympia, Washington 1891.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Georgetown Mining District, New Mexico.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Although the mining districts of Southwestern New Mexico have attracted but comparatively little attention, many of them are now giving promise of becoming of considerable importance. Among the prominent mining districts of this portion of the territory may be mentioned Lake Valley, Hillsborough, Kingston, Pinos Altos, Georgetown, Silver City, Cook's Peak, Carlisle, Hachita, Black Hawk, Silver Creek and Lordsburg.

One of these, Georgetown, situated near the Mimbres River, 25 miles northeast of Silver City, has been a steady producer for the past 18 years and has contributed much to the prosperity of this section. Quite extensive mining operations are being conducted there at present.

The geological formation of this immediate region consists mainly of a hard and compact blue limestone, quartzite, and black shales, of the sub-carboniferous age. Running through this district are several dikes of porphyry, the two largest and most important of which have a trend approximately northwest and southeast. The lowest sedimentary rocks are quartzite, which rests upon the granite below. Superimposed upon the quartzite is a heavy bed of limestone, and overlying it, conformably, is a vast stratum of black shale. Over this sub-carboniferous formation is another stratum of limestone, which is similar, lithologically, to that of the lower bed. At the contact between the lower limestone and the black shales, the rich ore of the district occurs. The ore is rich, assaying often over 100 ounces silver per ton. C.

SILVER CITY, New Mexico, Feb. 14, 1891.

A New Method for the Production of Pure Oxygen.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It may be of interest to some of the readers of the ENGINEERING AND MINING JOURNAL to learn of a comparatively cheap and practical method which will furnish an ample supply of pure oxygen gas from a solution of chloride of lime (bleaching powder).

The production of this gas and its method were observed and investigated by the writer some years ago, and it has since been practically used by him in the laboratory for various purposes. If this method becomes generally known it may find manifold application owing to its cheapness and simplicity.

If a few drops of a solution of a cobalt salt, nitrate of cobalt, $Co(NO_3)_2$, for instance, be added to a strong solution of bleaching powder in water, $H_2O + CaCl_2 + Ca(ClO)_2$, and shaken well, an evolution of gas will be immediately observed, the production of which will be increased by a slight rise of temperature. The gas thus produced is pure oxygen, free from chlorine, and may be dried, if required, in the usual manner.

The evolution is not violent, and the reaction gives an even and continuous flow of oxygen gas for a long time; that is, until all the bleaching powder in solution is converted into calcium chloride.

$$CaCl_2 + Ca(ClO)_2 + H_2O = 2O + 2CaCl_2 + H_2O.$$

The few drops of nitrate of cobalt added are precipitated by the bleaching powder to cobalt hydroxide, which suffers no further change, only producing by its presence the liberation of the oxygen. It is a beautiful illustration of its catalytic action.

It is needless to say that the precipitated oxides can be used over again, *ad infinitum*, with the same effect. I decant the calcium chloride solution from the settled cobalt hydroxide in the generator, charge with fresh solution of bleaching powder, shake it, and the evolution of oxygen commences again.

Nickel salts will act on bleaching powder in the same manner, but the evolution of oxygen is much slower. WERNER LANGGUTH.

GOLDEN REWARD CHLORINATION WORKS, Deadwood, S. D., Feb. 28, 1891.

A Peculiar Occurrence of Gold.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: While in Honduras recently I found gold in what is to me a novel connection. I had heard of it before I saw it, and, whether unusual or not, it was a puzzle to prospectors and mining engineers alike.

The ore was a ferruginous quartz occurring in small veins near Concordia, in the Department of Olancho. When ground to pass a 40-mesh sieve and washed in a horn spoon, a white or yellow substance was found which was so little heavier than the iron oxide as to be separated from that only with difficulty and by a peculiar manipulation. No gold was seen, although the assay showed in some cases as much as four ounces per ton.

On grinding the substance in an agate mortar, gold became visible, and on treatment with nitric acid dissolved with effervescence, leaving yellow, flocculent matter and a considerable quantity of high-grade, clean gold.

These facts seemed to indicate calcium, strontium or barium as carbonate, but the nitric solution did not respond to tests for these nor for lead. I then felt almost sure that I had spathic iron to deal with, but on charcoal before the blowpipe the stuff melted, gave a yellow sublimate which was not that of zinc, and, on addition of sodium carbonate to the assay, I obtained a bead of bismuth. The yellowish matter inclosing the gold was, therefore, bismuth carbonate stained by iron oxide.

I afterward dissolved a quantity of the substance, precipitated by dilution, collected, and smelted out a good bead of bismuth.

This reminds me of a characteristic reaction of bismuth which I have never seen mentioned outside of my own publications. If a bead of pure bismuth is melted before the blowpipe on a cupel, and allowed to cool, it becomes covered by a film of brown oxide. This much everybody knows; but if the cooled bead is examined it will be seen that the film of oxide is cracked across the top, and the bright metal is visible in the fracture.

In the case of bismuth, which I have smelted before the blowpipe from the native carbonate, the behavior was a little different; instead of the film being ruptured in the form of a crack, the bead gave birth to a minute globule issuing from the side to which the globule adhered, remaining lustrous, while the parent bead was dull. These phenomena I have verified repeatedly; they are referable to the well-known expansion of bismuth at the moments of solidification after fusion. C. H. AARON.

SAN FRANCISCO, March 1, 1891.

Transactions of Engineering Societies

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The discussion of the method adopted by the American Institute of Mining Engineers in publishing its transactions, which has been made the subject of comment by several correspondents in recent issues of the ENGINEERING AND MINING JOURNAL, has doubtless been read with a great deal of interest by many members of the Institute. The criticisms are sufficiently well founded, I believe, to meet with the warmest approval of a large number of them. At the same time I hardly think that the views expressed by "Abstract" in your last issue will be accepted without qualification. He speaks of the preparation of a comprehensive, carefully prepared series of abstracts of all papers published throughout the world that pertain to our profession, and would have these incorporated in our transactions. I consider my knowledge of these publications very limited, but would be appalled at the idea of abstracting those with the existence of which I am acquainted; but, apart from the Herculean task my fellow member would thus impose upon our secretary and his assistant, it does not seem to me that the mission of the Institute would thus be best fulfilled. The revision and abstracting of currently appearing scientific and technical literature belongs more distinctly to the professional journals, and cannot be attended to so practically and economically in any other way.

The suggestion contained in the last sentences of your correspondent's letter seems to be of far greater importance toward extending the usefulness of the Institute. Let it use its means in carrying out and encouraging the original investigations that such an institution should always be undertaking. Quite as noticeable a feature in the Transactions of the American Institute of Mining Engineers as the absence of all printed discussion is the absence of reports of special committees. An indistinct recollection in the minds of some of the older members is the only trace that the "Anthracite Waste Committee," once famous for its inactivity, has left behind it. No one will think of contesting the value of such reports, and results thus obtained and published would immediately attain the widest circulation.

I do not think that the members of the Institute are more averse to devoting a part of their time to such labors than are those of similar societies all over the world, and believe that all that is necessary is proper agitation of the subject. Reports of such committees would go partly toward filling the want of a national laboratory of technical research, which cause was so ably espoused in the pages of the ENGINEERING AND MINING JOURNAL last summer. H. A.

NEW YORK, March 9, 1891.

Treatment of Complex Silver Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The economical treatment of complex sulphide ores carrying silver has long been an unsolved metallurgical problem, and a description of a process that I have recently devised for this purpose, may be of interest. Its results have been successful. During 1889 and 1890 I treated at Thomasville, N. C., several hundred tons of ore from the Silver Valley mine, which averaged 27% zinc, and saved the gold and silver, 80% of the lead and 70% of the zinc, as oxide.

The method of treatment was as follows: The ore was crushed so as to pass a 40 mesh screen. If the zinc exceeded 21%, a sufficient amount of pyrites was added to reduce the zinc in the furnace charge to that amount, the purpose being to secure the necessary amount of sulphurous acid for further use. The charge, after being roasted until most of the sulphur is driven off, is drawn, and when cool, moistened with water, in which condition it is placed upon a layer of pebbles in a false-bottomed tank. The damp ore should all pass freely through a 4 mesh screen.

The sulphurous-acid fumes from the furnaces are now forced into the tank by a Root blower, having first been cooled in a coil of pipe in cold water, so as to pass the blower and tanks without injury to either. With the sulphurous-acid gas, a jet of steam at low pressure is admitted to the tank, thus facilitating chemical action. The result is the conversion of the zinc oxide to zinc sulphite, which rapidly changes to sulphate.

It is seldom that more than 14% of the 21% zinc in the charge is converted with the first operation, so that after leaching, the charge is subjected to the sulphurous acid and steam a second time, with the result of removing all the zinc oxidized in the furnace.

The apparatus employed is simple. A muffle furnace is used, and for each furnace of five tons capacity, four tanks, each 10 feet square and 40 inches deep, are provided. The ore in each tank is subjected to the sulphurous acid gas for 36 to 40 hours.

The ore is leached with water, in different vats from those in which it is treated with the sulphurous-acid gas, as in those it caused the charge to pack, so that the second gassing was impossible. The zinc having been leached from the ore, the residue, containing the lead and precious metals, is dried on an iron floor heated by the hot sulphurous acid fumes from the muffles, and is then ready for the lead smelters.

The zinc can be recovered from the leached liquor after settling any sand that may have been carried over by precipitation as hydroxide, with a stream of ammonia gas from a still. The supernatant liquid, containing ammonium sulphate in solution, is then passed into the still and the ammonia regenerated with caustic lime. The loss in ammonia at Thomasville was a little over 3% of the zinc recovered.

DENVER, Colo., Feb. 23, 1891. WILLIAM WEST.

The Highest Inhabited Places.—The highest place in the world regularly inhabited is stated to be the Buddhist monastery, Halne, in Thibet, which is about 16,090 feet above sea level. The next highest is Galera, a railway station in Peru, which is located at a height of 15,635 feet. Near it, at the same level, a railway tunnel 3,847 feet in length is being driven through the mountains. The elevation of the city of Potosi, in Bolivia, is 13,330 feet; Cuzco, Peru, 11,380 feet; La Paz, Bolivia, 10,883 feet, and Leadville, Colo., 10,200 feet.

ORE SUPPLY FOR VIRGINIA FURNACES.—II.

Written for the Engineering and Mining Journal by Edmund C. Pechin, Roanoke, Va.

It is easy to talk of mountains of iron ore, incalculable hidden wealth and limitless supplies, but it takes a good deal of hard, persistent and methodical research to find small hills, let alone mountains, of ore, an alchemist's wand to locate the hidden wealth, and lots of grit, money and time to break into nature's storehouses, except to the promoter or speculator, and he only requires a moderate amount of ink and paper and a fluent tongue to instantly overcome the difficulties that to the ordinary mortal are very great.

In a former article it was stated that one could readily build a modern furnace in Virginia, but, as mining matters *now* stand, might find it hard to keep it supplied with ore when built.

This is a broad statement, but it is fairly capable of proof. The main, and indeed the only present sources of a large supply, for Virginia furnaces are the brown ores of, respectively, the Potsdam slates (No. I.) of the Blue Ridge; the Silurian limestones (No. II.) on the Cripple Creek road; and the Oriskany sandstones (No. VII.) on the Chesapeake & Ohio Railway. Of the magnetic ores of the older rocks, little is known as yet as to quantity, and the mining is on so limited a scale as to make them valueless, except for admixture to a small extent with the brown ores. Assuming that they run in stratified veins over long distances, and average three to four feet in width (a very full figure), it will take a very considerable expenditure of time and money to open mines capable of a large output.

The gossans of Carroll County, which will be treated in a separate article, are only just coming into the market, and, although likely to be, are not as yet, an important factor.

The Potsdam Brown Ores.—These are to be found of varying quantity and quality in close proximity to the Norfolk & Western Railroad, from the Potomac River to the Tennessee line. I take from a former paper their average composition: Metallic iron, from 38% in wash to 57% in picked lump; silica, from 3% to 22% in wash or lump; manganese, from 0·10% upward; phosphorus, from 0·10% to 3·5%; alumina, from 0·5% to 4·5%; lime, under 0·75%; magnesia, under 0·50%; sulphur, as a rule, in hundredths of 1% or inappreciable.

The ore deposits of the Potsdam slates are fairly continuous, but not persistent as to quantity. Extraordinary and bewildering variations constantly take place, making theoretical explorations and development utterly impossible. There may be stretches of good ground, in themselves extremely irregular, but in the main giving quantity; and there may be miles of the same measures, showing apparently continuous ore, yet not in sufficient quantity, or of fair enough quality, to justify mining operations. These ores lie in the foothills of the Blue Ridge, oftentimes in inaccessible localities, and frequently a long distance away from an essential—water.

As a rule massive or lump ore lies near the surface, or as occasional bowlders among the wash ore, but steadily diminishes in depth. If I mistake not, Prof. Lesley, many years ago, called attention to this fact. It is safe to assume that not over one-eighth of the output is lump ore. The fine ore is imbedded in, or mixed with, clay, and the percentage of ore and clay is constantly varying. At times pockets, lenses or stringers of ore ground will wash one yard to two—more frequently one yard of ore to three, four and five yards of dirt. I have it from an old and experienced miner that he is to-day, on the Cripple Creek ores, washing from 14 to 16 yards of dirt to get one yard of ore.

In brown-ore ground, we can make no calculation whatever of even the approximate output of ore from a given area. What to-day may be a breast of first-class ore ground may next week be cut out wholly or in part by horses of clay, of varying size, either to be left standing or removed as deads.

Extraordinary local variations in phosphorus and manganese take place. I have in my own present experience an illustration of this. An open cut working on a hillside was giving good wash ground, say one to three, and was normal in phosphorus and manganese. A shaft sunk some distance back of this working went through 35 feet, vertically, of high-grade ore ground, yielding 75% of ore. The percentage of iron ran up to 54%, silica under 6%, but phosphorus up to 2·13% and manganese 1·34%. One hundred feet back of this, on the same line, the ore gave ·46% of phosphorus and 3·18% of manganese.

Beside pockets of ore high in phosphorus and manganese, streaks of sandstone will come in without warning, giving free silica or ore high in silica. Horses of clay of any and every size are likely to be struck at any time. These drawbacks are particularly mentioned, to emphasize the fact that even in good ore ground, in order to get a full output of average yield, a very large number of openings must be made and kept in good working order, so that when adverse conditions are met at one point, the working force can be at once reduced, and most of the men transferred to another opening where the conditions are normal, in order to equalize the whole output. The men who for the last half century have been mining these same ores in Lehigh and Berks County in Pennsylvania can fully appreciate the above, and they know what it means in time and money to properly open mines, and they also know that the work cannot be done in a hurry. It remains for the traveling correspondent of a newspaper, or the optionholder who wants to unload with a big bonus without any investment, or the visionary who looks forward to becoming a millionaire in a night to brush away with a wave of the hand difficulties that confront, harass and worry the man who has spent his life in learning his work and who represents hard fact against frothy fiction.

If any one wishes to come to Virginia to mine brown ores either for the open market or for a furnace, he may look the following conditions squarely in the face:

1st. He must, by patient and thorough investigation and positive explorations by shafts and crosscuts under cover, reasonably satisfy himself that there is a fair prospect of making a mine. Surface showings, no matter how big they look, are many times not worth a pinch of snuff, being oftentimes either slop-overs or blankets, with no real width or depth, or they may be simply local deposits shoved out of place, which are isolated and soon pinch out.

2d. When he thinks he has found a good thing, he must find out whether the party selling it has a good title; sometimes he has, but very frequently he has not.

3d. As stated above, the ores lie in the foothills of the Blue Ridge, generally in remote and inaccessible localities. He must either build himself, or get the railroad company to build, from one to twelve miles of track, as a rule with heavy grades and sharp curves, possibly getting over divides by means of switchbacks.

4th. He must erect a first-class washing plant of double-log washers, with simple, strong engines and boilers of full power. Fancy work will not do, as repair shops are remote and good engineers scarce. Picking belts are a necessity if the ore is to be properly prepared. All this means a considerable outlay of money and time. As a rule, the clays accompanying these ores are unctuous, stiff and clogging, and can only be handled by log washers of approved make and modern construction. Where the soil is friable and loamy, the Carter washers can be used, but this is the exception.

5th. He must provide an ample water supply. This is essential. One double log washer capable of turning out, say, from 80 to 120 tons of ore a working day, will take about 300 gallons of water a minute. Many of the best deposits known are a long way from sufficient water, and an adequate supply must be had. At one large mine under my own supervision, we are arranging to put in a powerful pumping station, with a pipe line from two and a half to three miles in length, with an elevation of 250 feet to overcome. This means a big lot of money. The only alternative is to run the dirt from the mines to the water, which is the handling of an immense amount of waste. The ground justifying it, a pipe line is true economy.

6th. He must build houses for the foreman and men, and provide or run a commissary. The ores being in sparsely inhabited districts, labor must be brought in and cared for.

7th. He must secure proper labor in advance. Reliable labor is the crying want of this whole country. The extraordinary development that has been and is going on, has absorbed all local help, and, while considerable has come in from the outside, there has been nothing like enough to meet the demand.

Negro labor is docile, good while actually working, but unreliable. A cold morning makes the "shack," with its smouldering fire, much more attractive than outdoor work, and as long as "hog and hominy" lasts, the shack keeps ahead. The ease with which a negro can get sick, if he thinks he ought to be, is extraordinary. A circus within ten miles will deplete a camp as quickly as if a pestilence had struck it.

The climate, the country and the surroundings generally are admirably fitted for white labor of every kind, and it must be brought in and localized if positive and satisfactory mining results are to be reached.

The point that I wish to make is this: with the peculiar conditions confronting the operator all through this mineral section, anything like a quick result from a mining enterprise is impossible. A load of money first and then lots of time to get mines in shape are required to run even one modern furnace successfully.

The men who do not get their mines fully opened at least two years before they lay the first foundation stone in their furnace plant are, in my judgment, making a great business mistake.

With the proper outlay and attention given, the cheapness with which the Potsdam brown ores can be had, is surprising. A very great change is now taking place, and better methods, improved machinery and more systematic management are laying the foundations strongly and deeply for a most successful and gradually but surely growing great iron industry. In another article I will call attention to other sources of supply.

(To be concluded.)

ESTIMATION OF ZINC IN ORES.

By D. Coda.

The usual method of determining zinc in its ores consists in dissolving the ore in aqua regia, evaporating, redissolving in dilute hydrocholoric acid, precipitating lead, copper, and cadmium with hydrogen sulphide, oxidizing the iron and precipitating with ammonia containing some ammonium carbonate; the iron is thus precipitated and the zinc remaining in solution is estimated with standard sodium sulphide solution. The objection to this method is that the iron precipitate invariably contains zinc, even in the presence of ammonium carbonate and when the precipitate is left in the liquid for 24 hours. Better results are obtained by dissolving the precipitate and reprecipitating it, allowing it to remain in the liquid for 24 hours after reprecipitation; but this is not expeditious.

The method which the author has devised depends upon the fact that if ammonium sulphate be present the ferric hydrate will combine with it instead of with the zinc oxide. The method as described in *Zeits. Anal. Chem.*, 29, 266–271, is carried out as follows: 2·5 grammes of the zinc ore are dissolved in 15—20 c. c. of aqua regia and evaporated to dryness; 15—20 c. c. of sulphuric acid are added and the mass heated till white fumes come off, so as to insure removal of chlorine and nitric oxide. In presence of copper, cadmium, etc., it is then diluted, precipitated with hydrogen sulphide and filtered; the hydrogen sulphide is expelled from the filtrate by boiling and ammonia is added till the liquid is neutral; 40 c. c. of ammonia containing 25% of ammonium carbonate are then added. After the flask has cooled, its contents are made up to 500 c. c. and filtered through a dry filter; 100 c. c. (0·5 gramme of ore) are taken, diluted to 250 c. c. and then titrated with a 2% solution of sodium sulphide. The details of the titration are as follows: A weighed quantity of pure zinc, as nearly as possible identical with the quantity in the ore, is dissolved in 4 c. c. of concentrated hydrochloric acid, made alkaline with 20 c. c. of ammonia, and diluted to 250 c. c. This solution and that to be analyzed are placed side by side, and the sodium sulphide run in from a burette till the zinc sulphide is nearly all precipitated; the precipitate is then allowed to settle, and a small portion of the clear liquid is placed on a porcelain plate and mixed with a spot of an 8% solution of sodium nitroprusside; this operation is repeated till a red color is seen on mixing the drops; the flask must be well shaken after each addition of sodium sulphide.

Mining Accidents and their Prevention—Mr. Edwin M. Keatley, Mining Engineer of Raleigh C. H., W. Va., writes: "Abel's Mining Accidents and their Preventions" is a magnificent work and the ENGINEERING AND MINING JOURNAL has not said half enough in its favor. Every mining man should have a copy.

REPRESENTATIVE AMERICAN METALLURGISTS.

Francis Clark Blake.

Francis Clark Blake was born in Cumberland, Maine, February 23d, 1854, and died in Helena, Montana, February 21st, 1891. He was the son of Rev. Joseph Blake, late of Andover, Mass., and nephew of Judge Blake, of San Francisco. A few years after his birth, his family moved to Wells, Maine, which became the home of his youth, and which now holds in its bosom his mortal remains. Wells was the home of his mother's people, and always occupied a warm place in his affections. Mr. Blake was one of a large family, and, as a minister's salary is not always of the amplest, he was constrained at quite an early age to push out into the world and make a way for himself. He was a hard worker from the beginning and owed all his success to his own unaided efforts.

Mr. Blake first entered the extensive works of Washburn & Moen, of Worcester, Mass., where he learned the trade of machinist. He showed himself so quick and capable that he attracted the attention of Mr. Moen, who took a great interest in him, and who, doubtless, encouraged him in that ambition to educate and fit himself for wider fields of usefulness that led him to enter the Worcester Polytechnic Institute. He worked his own way through the school, graduating, in the course of physics, in 1876.

In 1877 he was called to Lafayette College to take the position of Adjunct Professor of Chemistry, which he filled with honor and ability for two years. While at Easton he became acquainted with the daughter of Dr. Ballard, Professor of Moral Philosophy, who became his wife in 1885. In 1879 he accepted the position of Assistant Superintendent with the Pennsylvania Lead Company, which he served so faithfully and ably

FRANCIS CLARK BLAKE.

until his death. On the resignation of the superintendent, Mr. E. F. Eurich, in March, 1881, Mr. Blake was appointed to succeed him. For ten years he devoted all his energies and talents to the development and improvement of the great refinery which had been entrusted to his care. The works as they stand to-day are a substantial monument to his genius and fertility of brain.

His was an unusually active and inquiring mind, an inventive mind, teeming with new and brilliant ideas, never content to rest in the common-place, and always hunting out new aspects of things. This quality was noticeable in other than scientific directions. Almost every incident of the day, an item in the newspaper or a passage from a book would bring out some quaint and unexpected remark which proved his fondness for seeking some out-of-the-way angle from which he might view things. He had a powerful memory for facts, which enabled him to retain all the valuable parts of his extensive reading and to apply them to practical use as opportunity arose. He was a great lover of books and accumulated in a few years of his business life one of the choicest and most extensive scientific libraries west of the Alleghanies.

To those who knew Mr. Blake, it is not necessary to enumerate the many qualities of mind and heart that won him the respect and friendship of all about him. He was a quiet, strong, earnest, genuine man. But perhaps the most striking characteristic of all was his kindness of heart, and his readiness, nay, his eagerness, to help others bear their burdens.

His life was full of results. He had become a recognized authority in his special branch of the profession, and was cut down in the midst of investigation in various subjects, and especially in electrolysis, which could hardly have failed to contribute important additions to the sum of metallurgical knowledge. A brilliant career has thus been brought to a close, all too early.

G. F.

SOME BANKET DEPOSITS OF THE GOLD COAST, WEST AFRICA.*

By Edward Halse, A. R. S. M.

The chief mines of the Gold Coast are situated in the Wassaw country, between 4½° to 5½° north latitude and 1½° to 2¼° west longitude. Leaving recent alluvial deposits out of account, we may divide the mineral deposits into two classes: (1) Gold-quartz fissure veins traversing schists, and (2) bedded-gold alluvial deposits inclosed in sandstone lying unconformably on (1).

The mines described are about 50 miles from Axim, on the seacoast. A number of hills, usually of small extent and low elevation, traverse the region, which is covered by forest and dense brush, in a direction a little east of true north. The auriferous veins and banket seams, as a rule, follow the direction of the hills.

Taquah Mine.—The main bed of this deposit, which strikes from north 1° west to north 32° east, appears to form a distinct saddle, but is rather a division of the seam into two portions by a mass (horse) of sandstone. The general dip is northwesterly. At first sight the seam does not look like a banket deposit; however, a minute examination shows that it is in reality a very fine conglomerate arranged in layers passing occasionally into coarse conglomerate on the one hand and into fine sandstone on the other. The seam may roughly be said to consist of layers of titaniferous iron ore carrying free gold, alternating with layers of talcose sandstone practically non-auriferous. The width of the layers varies, as well as that of the whole seam. The bottom portion of the bed, from 6 to 12 inches thick, contains much titaniferous iron, has the most free gold, and is alone attacked by the native Fanti miners working on tribute. They sink a small chimney ("tobon") about 2½ feet in diameter to the rich portion of the seam, and to a limit of about 100 feet in depth, which they work out in a very irregular manner, not understanding systematic driving and stoping. In one case some native workings measured only 14 inches in width. The natives sink with an iron hoe, using also, it is said, a method of "fire-setting," and exploit the seam with hammer and chisel, carrying the mineral to the surface in earthen pots or calabashes, up bamboo ladders about 5 inches wide suspended from the pit mouth. The native method of gold mining and washing on the west coast of Africa was described many years ago by Mungo Park, and quite recently by Mr. Skertchley (Jour. Roy. Geogr. Soc., Vol. 48, 274-283), It was formerly the custom to allow the natives thus to work out portions of the seam on tribute—the company providing the tools, and allowing the natives half the ore raised to bank. This method was merely an imitation of the old native custom of paying half the ore won to the kings and chiefs, and, as it is very open to the practice of fraud, it has recently been abandoned. The whole seam is sent to the mill, where it undergoes a partial hand-picking, and at present yields from 5 to 7 pennyweights of gold to the ton. The gold, being entirely free, is readily caught on the plates, although that in a very fine state of division ("flour gold") is only partially saved. Assays of samples confirm the panning results by showing that where there is most black sand there is most gold.

Abosso Mine.—This is six miles north of Taquah village, and is one of the most promising mines on the Gold Coast. The seam runs north 38° east true, with an average dip of 35° northwest, and is a true banket deposit, although portions of it closely resemble the Taquah bed. Both strike and dip are very uniform and the hanging wall well defined; but the thickness varies from 2 to about 18 feet. The following is a section of one portion, beginning at the roof: 2½ feet of light-colored sandstone,

*Abstract of a paper read at a recent meeting of the North of England Institute of Mining and Mechanical Engineers.

with some titaniferous ore, poor in gold; 6 inches of auriferous conglomerate; 9 inches of sandstone, rich in black sand and free gold; 9 inches of rich conglomerate; 12 inches of sandstone rich in titaniferous iron ore and free gold; total thickness, 5½ feet. The true roof is a grit about 25 feet thick, above which is talcose sandstone, overlaid by a red marl near the surface. Immediately below the seam is usually a thin layer of pipe clay, but talcose sandstone forms the true floor or footwall. Assays of samples of the richest portions of the seam vary from 4 to 15½ ounces of gold to the ton, but the average milling result with 12 small heads for some time was only about 13 pennyweights of gold to the ton. From 12 to 15 pennyweights have recently been the average of the main reef series of Witwatersrand, South Africa. The gold varies in size from that of a pin's head to impalpable powder, and is generally water worn, although thin plates and crystals are sometimes to be seen. The conglomerate consists of rounded quartz pebbles and occasional pebbles of hard quartz or rock of various sizes, but seldom larger than a hen's egg, set in a quartzose matrix, and often containing black titaniferous iron ore. It resembles the greenish-gray pyritic conglomerate found below the water level at Witwatersrand more than the red banket above it, although no pyrites has as yet been met with in the Gold Coast bankets. The gold generally occurs in the cement, and is sometimes seen collected round the quartz pebbles (compare Alford on the Witwatersrand bankets and Furlonge on those of De Kaap). A shaft is now beink sunk to the dip to open the mines at a lower level.

Adjah Bippoh Mine.—This is about one mile northeast of Abosso, with a similar strike, but dipping 60° at the south and 75° at the north end, while the center portion is nearly vertical. The seam is also heaved in one place by a cross-joint. The thickness varies from 1 foot 9 inches to about 7 feet. In 1888, at 100 feet from the surface, the average width of the seam was 3 feet, and the yield 10 pennyweights. The cement of this banket is in the main composed of blue hyaline quartz.

Cinnamon Bippoh Mine.—This mine lies two miles northeast of the last. The seam dips 45 degrees, and is from 2 feet to 3½ feet thick. It varies from light-colored to very dark material, with a cement of blue hyaline quartz. Like the last, this is a most pronounced banket deposit.

Teberibi Mine.—This lies between Taquah and the Ancobra River, but is not now (1890) being worked. The seam here is similar to the Taquah bed, and is conglomeratic in places, dips 45 degrees, and at 100 feet the yield was six pennyweights.

Geological Notes.—The district at present explored measures about 14 miles in a northeast (true) direction by about three miles in width. The writer has seen no true gneiss in the district, although it is said to form the country rock of some of the mines; but sandstone, when veined with titaniferous iron ore often assumes an appearance closely resembling that rock. The beds have evidently been quietly deposited by water, while even the pebbles of the bankets often show a roughly parallel arrangement, and the gold has undoubtedly been deposited contemporaneously with the rock in which it occurs, differing in this respect from that of the Witwatersrand and DeKaap banket reefs (see J. S. Curtis and W. H. Furlonge in ENGINEERING AND MINING JOURNAL, 1890, Vol., XLIX., pp. 200 and 287.) The bankets of West Africa are alluvial deposits, but whether the sandstones and conglomerates were deposited on a sea shore, or in an inland lake or lagoon (as seems probable), or on the bottom of a wide river, cannot yet be satisfactorily determined. Along the shore at Axim and Winnebalo the deposition of sand and titaniferous iron ore is seen going on at the present day; a little inland the native pits show titaniferous sand resting on a clay bottom, while in the Appam district near Winnebah outcrops of ironstone in detached bowlders occur veined with quartz showing visible gold. M. Bonnat in 1879 found the bed of the Ancobra, some distance above the first rapids, to consist of from 5 to 8 feet of white quartz pebbles, pieces of broken quartz, and white sand resting on 1½ feet of pipe clay, below which is an unknown thickness of auriferous sand. The result of a current flowing over such a bed, and bearing gold, iron sand, etc., in suspension, is worth considering. These would be a great drag along the bottom, and the heavy gold and iron sand could readily drop on to and filter through such a mass; the quartz pebbles would to a certain extent act like the stones forming the pavement of an hydraulic sluice. In this way the greater richness of the lower part of the coarse bankets can be partly accounted for, as well as the smaller proportion of gold in the finer ones.

The banket deposits of Wassaw have clearly been built of material resulting from the disintegration of older rock, which probably consisted of talcose schist and quartzites traversed by auriferous veins of quartz and ironstone, or they may have been derived directly from conglomerates of older date. Subsequent to their deposition and consolidation the bankets have been tilted to an angle of from 30° to 90° from the horizontal; but as yet no eruptive rocks have been found in the district to account for this, and there is also a marked absence of faults. Both eruptive rocks and faults are common in the banket districts of South Africa. The deposits are probably of comparatively recent geological age, aslittle or no metamorphic action can be traced in them or in the adjoining strata, differing in this respect from the Witwatersrand bankets. Towards the northeast of the area the conglomerates become more and more clearly defined; in the center of the area conglomerates and titaniferous sandstone occur in alternate layers, while the southwestern portion is characterized by highly talcose alluvial deposits showing very little conglomeratic structure. This would appear to show that the current conveying the materials for the building of the bankets came from a northeasterly direction. It has quite recently been observed that the gold in some of the Witwatersrand bankets is distributed mainly in lenticular-shaped masses, the dip of which is not stated, and the gold in one, at least, of those of West Africa occurs in chutes dipping southwest. At the Akankoo quartz-fissure mine, lower down the Ancobra, the chutes of ore are said to dip in the same direction. These chutes in the case of the West African bankets are probably the result of the redistribution of the gold long after the tilting of the rocks.

Mode of Working.—The whole of the seam is taken out, the space between the walls being kept open by props, sometimes 18 feet long, placed perpendicularly to the dip, or the poorer upper portion of the seam is left standing, in which case careful propping is necessary, or where the seam is thin a portion of the roof is stripped down and packed behind polings reaching from one stull piece or bearer to another.

Amalgamation.—Sieves of No. 36 and 37 gauge are used in the batteries, and the pulp passes over amalgamated copper plates 16 inches long and inclined five degrees into lower amalgamated plates 8 feet 9 inches long, and thence over blanketing. A large amount of mercury and very little gold are recovered from the blanket tailings. Most of the find gold is supposed to float off on the surface of the dressing water, as the final tailings only yield about one pennyweight of gold to the ton. From 13% to 22% of the total amalgam is caught on the lower plates. The amalgam is very hard and is scraped off with steel tools having a sharp edge. Two and one-half ounces yield roughly one ounce of gold of 23 carats fine, which realizes about $19.50 per ounce troy.

Labor.—Native Fantis and Kroomen are employed to work the mines. The Fanti laborers are paid 25 cents a day, but are extremely indolent and unmanageable. The Kroomen are paid from $4.37 to $5.80 per month, and in addition receive daily rations of rice and beef once a week. They work in gangs under headmen for 12 months at a time, free passages to and fro and subsistence being provided for blacks brought from up the coast. Fantis are also used for light transport work, and are paid at the rate of about $1.58 per long ton per mile along bush track, but Kroomen are employed for bringing up heavy machinery. The freight from the coast to the mines varies from $48.50 to $97.20 per ton.

Leases.—The mines are leased from the king or head chief of the district, and are let for a term of from 50 to 100 years at a dead rental of from $486 to $972 per annum, the king taking a certain proportion of this rent, and the subsidiary chiefs dividing the remainder, usually in unequal proportions, according to their status, etc. In some cases a sum of from $486 to $972 is paid down on the granting of the lease, and subsequently a yearly rental of $486 is paid, as well as three per cent. of the net proceeds of the mines (Dahse).

Machinery.—Small Bilkville boilers used to be employed in the mines; but they have recently given way to larger horizontal and vertical multi-tubular ones, and to one mine on the banks of the Ancobra large Cornish boilers have been sent out whole, which, properly incased in wood, were floated over the bar and up the river to the mine. Horizontal and vertical engines and stamps by Fraser & Chalmers, of Chicago; by Harvey & Co., of Hayle, Cornwall; by the Sandycroft, and other well-known firms have been erected of late years, and efficient hoisting and pumping engines are also rapidly coming into vogue. Sufficient water can, as a rule, be obtained for dressing purposes, for feeding boilers and the like, while steam power is used for driving machinery, wood being the fuel used.

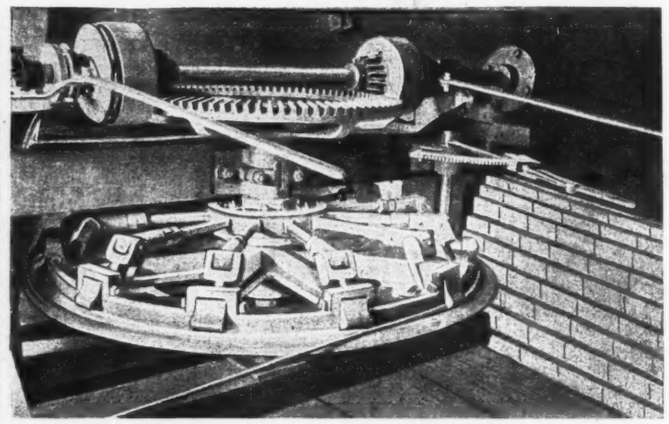


FIG. 1.—GRAVITY PLANE, MOULTON HILL MINE, QUEBEC.

Cost of Working.—This, on account of the position of the banket mines, is, of course, high, but need not exceed six pennyweights of gold to the ton, and with better roads, and therewith more efficient plant, could be reduced to five pennyweights, or in money value about $4.86 per ton.

Production.—The present production of the four or five banket mines now being worked is at the rate of about 5,000 ounces of gold per annum; this will probably be doubled very shortly.

Climate.—This is undoubtedly bad, owing to the dense bush, with its numerous marshes and decaying vegetable matter; ordinary intermittent fever is rife, and no European is exempt from it for a long period. On the other hand, the unhealthiness of the Gold Coast is often grossly exagerated, and illnesses and deaths have over and over again been put down to the climate that should rather have been debited to the too frequent use of spirits and other excesses. Europeans must take plenty of quinine, live temperately and avoid exposure to the hot midday sun and to the malarial mists of the early morning, evening and night. The climate will gradually be improved as the bush is cleared and the swampy land drained; but until the mines are paying well little improvement can be expected in this direction, unless the government of the Gold Coast steps in and materially aids the mining companies.

History.—A writer in 1665 refers to the native method of working by digging deep pits and washing the earth in large bowls. William Bosman, in 1704, alludes to the mines of Wassaw. John Barbot, in 1732, says the mines were not then worked by the Dutch, but that they had erected forts to protect the trade with the natives. In 1874 M. J. Bonnat helped to float the *Société des Mines d'Or d'Afrique Occidentale*, the primary object of which was to secure river concessions and demonstrate the practicability of dredging the Ancobra bottom for gold. Bonnat arrived on the coast with three companions on the 10th of April, 1877, but was quickly seduced by the superior charms of quartz mining and, after three years' explorations, returned to France and, in 1879, formed the African Gold Coast Company, which may be called the pioneer company for working the mines of the country. The first mines worked were Abosso and Crockerville (Messrs. Swanzy & Co.), in 187-; Effuerta followed in 1880, Taquah in 1881 and Adjah Bippoh (Wassaw Gold Mining Company), Abbontyentroon (Gold Coast Company) and Teberibi in 1882. Bonnat returned to the Gold Coast in 1881 to open up Taquah mines, and died there in 1882.

GRAVITY PLANE AT MOULTON HILL MINE, QUEBEC.

The accompanying illustrations of the novel gravity tramway at the Moulton Hill Mine, Quebec, which was described in the ENGINEERING AND MINING JOURNAL of January 31st, taken from recent photographs, show more plainly the obstacles which had to be overcome in this special problem. It will be noted that the fall of snow is extremely heavy, and at times there is a large accumulation in drifts.

The route finally selected for the gravity tramway involved the construction of considerable trestle work through a swamp below the mine; but this is now serving the double purpose of keeping the track above the snow and as a waste dump. The cut between the check house and tipple, lying in a very exposed position, was covered.

The grip wheel around which the rope passes in the engine room at the mine, is shown in Fig. 1. This wheel is positive in its action, the gripping levers, twelve in number, successively catching and releasing the rope as it comes and goes from the wheel. These levers are adjustable and are brought into action by a cam on the vertical spindle. The wheel is controlled by a brake lever, shown in the illustration at the left. A crown wheel gives connection, through two friction pinions and a horizontal shaft and a coupling, with the crusher engine, permitting the application of steam power to move the grip wheel in either direction as called for by signals. When gravity alone is acting, through the descent of the loaded car on the incline, the two pinions run loosely on the shaft.

The mine shaft house and head of the tramway are shown in Fig. 2; the trestle in Fig. 3; check house in Fig. 4; and the foot of the incline at the railroad in Fig. 5.

FIG. 2.

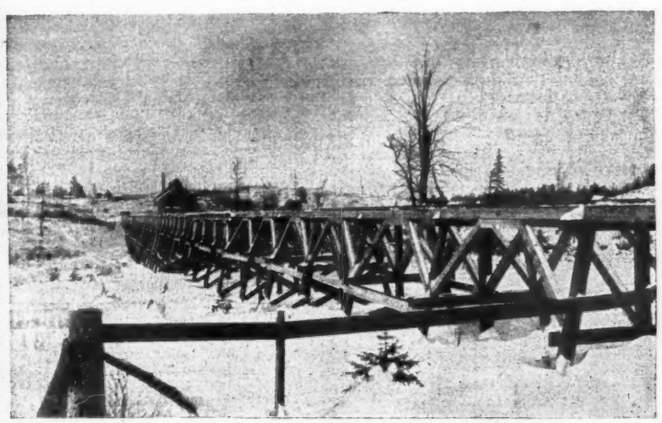


FIG. 3.

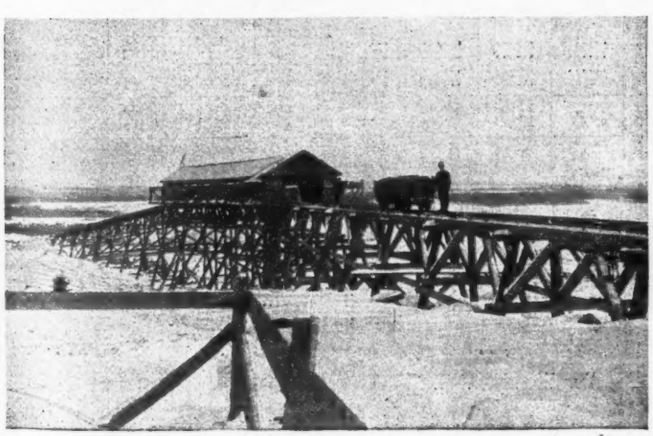


FIG. 4.

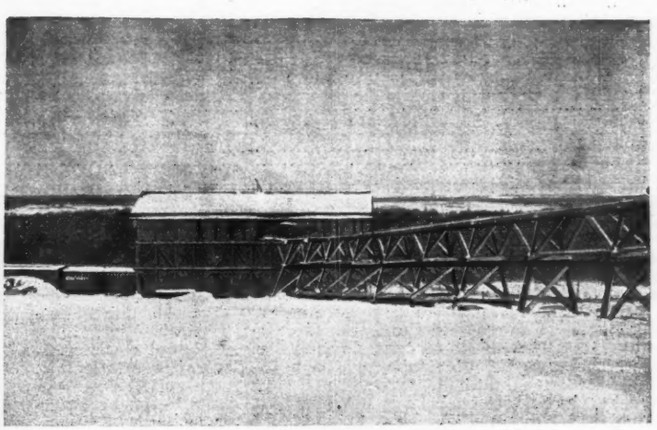


FIG. 5.

GRAVITY PLANE, MOULTON HILL MINE, QUEBEC.

NATURAL GAS IN IRON MAKING.*

W. F. Durfee.

Among the more recent improvements in the manufacture of iron and steel, the use of gaseous fuel stands conspicuous. The idea of first converting the fuel into a combustible gas, and conveying this to the point where heat was required, and there igniting it, is a very old one, and, in one form or another, it has been employed over a thousand years; but it is only within the present century that the manifold advantages of gas as a metallurgical fuel have become fully recognized by the iron and steel workers of the world. The early gas furnaces used in Silesia, Sweden and other European countries were but enlarged modifications of Geber's Tower of Athanor, and, although they were a great improvement on the furnaces in which solid fuel was burned on a grate, yet they were not able to produce a temperature sufficiently high and controllable to satisfy the demands of the rapidly developing iron and steel industries.

The gas furnace most commonly used in the American iron and steel industry was invented about thirty years ago by the brothers Frederick and Charles William Siemens, German engineers resident in London. The first Siemens furnace built in this country under the sanction of these inventors was erected at the works of John A. Griswold & Co., at Troy, N. Y., in 1867, and was used as a heating furnace. This was followed in the same year by a heating furnace at the works of the Nashua Iron and Steel Company, Nashua, N. H., and early in 1868 the first Siemens furnace for melting steel in crucibles (often called a "pot furnace") was started in the works of Anderson & Woods at Pittsburg. The first works in which the Siemens gas furnaces were used, to the exclusion of all other methods of burning fuel, were those of the American Silver Steel Company, at Bridgeport, Conn., which were erected in 1868-69. In these works were two puddling furnaces, three heating furnaces, one 24-pot melting furnace, a 24-pot muffle and ten gas producers, all on the Siemens principle. Gas from the producers was used under the boilers with entire success. At the time of the erection of these works they were the largest and most perfect plant of gas furnaces in America.

Natural gas has been known to the nations of the Old World for thousands of years. The Persian fire-worshippers used it for their sacred fire, and it has been used as a fuel in China since a time beyond the range of authentic history.

The earliest use of natural gas in this country was as an illuminant in the village of Fredonia, N. Y., in 1827, and it is still used there. The first person to use natural gas for manufacturing purposes is believed to have been Mr. William Tompkins, who, in 1842, employed it in the Kanawha Valley for heating the kettles of a salt block 100 feet in length. In 1845 Messrs. Dickerson and Shrewsbury bored a well on the Kanawha River, in West Virginia, to a depth of 1,000 feet, from which a sufficient quantity of gas issued, according to a computation by Prof. B. Silliman, Jr., "to light the city of New York for 12 years." The first use of natural gas for the manufacture of iron was in the Siberian Rolling Mill of Rogers & Burchfield at Leechburg, Armstrong County, Pa., in 1874, 29 years after it had been successfully used under a salt block in West Virginia and 47 years after its first use for lighting at Fredonia, New York.

* From an article in *Popular Science Monthly*, March, 1891.

German Steel Works.—The number of the German steel works, according to the *Rheinische Westphälische Zeitung*, is 22, with 83 converters capable of producing 1,707,000 tons per annum of Bessemer and Thomas steel. These are divided among the different German States in the following manner: Prussia has 17 works with 71 converters and annual capacity of 1,450,000 tons; Bavaria 2 works with 4 converters and 100,000 tons; Alsace-Lorraine, 2 works with 6 converters and 92,000 tons; and Saxony, 1 plant with 2 converters and 60,000 tons. Of the Prussian steel works the different provinces own: Rhine province, 8 works with 37 converters and 700,000 tons; Westphalia, 5 works with 20 converters and 460,000 tons; Hanover, 2 works with 8 converters and 160,000 tons; and Silesia, 2 works with 6 converters and 130,000 tons of annual production.

REVIEW OF THE CHEMICAL LITERATURE OF THE MINERAL WAXES.

Written for the Engineering and Mining Journal by Dr. Henry Wurtz.

At the close of a previous communication on the above subject to this journal* the present writer added: "With regard to the chemistry of the mineral waxes, I propose, with your concurrence, Mr. Editor, to prepare some abstracts of the observations of different chemists, from the bibliography of the subject."

This pledge he now proposes, to himself and to your readers, to fulfil, in so far as his time and ability will permit. It will be well, however, to premise that he does not propose here to set forth an exhaustive digest and discussion of the whole subject, with all its ramifications and affiliations. It is his object only to select and bring together such materials from the various records as may enable your readers to obtain a more definite idea of the nature, composition and properties of a class of bodies which, though now known to mineralogists and chemists for more than half a century past, seem yet to be matters of popular dispute and of general uncertainty even with regard to their centesimal composition, as well as to their place in the classification of carbohydrogen compounds.

There are numerous indications of the observation at early dates of materials assignable with probability to this class. These go back at least a century and a half, or to a period long before chemists had yet arrived at any reliable methods of determining the composition, much less the constitution, of carbon compounds. All sorts of provisional names were of course given to these materials, such as *mineral grease, mineral tallow, rock-tallow, mineral adipocere, earthwax*, (for the Caspian product) *neftgil, neftdegil, naphthadil*, etc., *fossil wax, mineral wax*, and so on. The last two names are even yet often employed, in a general sense, by reason of the unsettled condition of the nomenclature of these bodies.

The first printed account that I have myself been able to look up is to be found in the *Edinburgh Philosophical Journal*, Vol. XI., page 214 (1824), headed *Mountain Tallow* (attributed by Dana and others to Brande, though his name does not appear as attached to it). In this the writer refers to previous observations of similar materials, as on the coast of Finland in 1736, and as having been also encountered—where, he does not state—by a Strasburg physician named Hermann, and by the mineralogist Jameson. This so-called "mountain-tallow" from Loch Fyne is referred by Dana (and with much reason) to the mineral wax *hatchettine* from Merthyr-Tydvil in Glamorganshire.

Hatchettine, the first discovered of the mineral waxes, is stated to have been described by Conybeare in 1822, in the Edinburgh *Annals of Philosophy*, Vol. I., p. 136 (a volume which I have not been able to find as yet). In all its properties, excepting its fusing-point, the hatchettines coincide closely with the ozocerites, which were announced eleven years later. The fusing-point of Conybeare's Merthyr-Tydvil mineral being 115°, and of the "mountain-tallow" from Loch Fyne 116° F., while the varieties (or set of homologues) classed by Dana under ozocerite, range in fusing-points from 138° to 150° F. I find it cited, however, in Lowig's *Chemie der organischen Verbindungen*, 2,564 (Ed. of 1846), that the fusing-point of hatchettine "lies near 64° C." (= 147° F.). For this I have as yet found no other authority, and it may possibly be a misprint for 46° C. (=115° F.). It seems, nevertheless, by no means improbable that the original hatchettine of Conybeare of 1822 may be substantially the same mineral as the ozocerite of von Meyer and Glocker of 1833, and that it contains some small proportion of isomeric or homologous oils which lower its melting-point. This could be determined easily by a further examination of the mineral. If confirmed, it would be necessary to abandon Glocker's name ozocerite, as the latter would then fall under the older species hatchettine.

Another circumstance to be considered in this connection is that it was not until 1830 that the artificially-produced hydrocarbon waxes, the so-called paraffines, were discovered by Reichenbach. If, therefore, the view should be substantiated of those who refer the mineral waxes to the general formula, C_nH_{2n+2}, the artificial paraffine waxes must then, in strict scientific writings, become merely artificial hatchettines. And the name paraffine should in that case be dropped from such writings, or if it were retained would be only a "trade name."

Numerous cases similar to this (as assumed) have occurred in the recent history of chemistry. But in no such case would the producer—by synthesis or other artificial means—of a known product of nature, previously recognized and named by science, be allowed to coin a new name for it, unless, indeed, for mere trade purposes. As cases in point might be mentioned graphite, ultramarine, artificial rubies and other crystalline minerals. In the case of the artificial rubies† of Greville Williams, there were important variations from nature's products in density and other characters; yet as the essential specific characters were present, no new name was allowable.

The next step in the history was the discovery of *ozocerite* at Slanik, in Moldavia, by von Meyer, a collector of Bukharest in Wallachia, in 1833. It was described and the name conferred upon it by the famous mineralogist Glocker, in the same year, in *Schweigger's Journal fur Chemie und Physik*, (the precursor of the *Journal fur praktische Chemie*). The name ozocerite, *odorous wax*, is far from being an appropriate one, inasmuch as the odor is only occasionally present, and is due entirely to foreign impurities. The first analysis was made in the same year by Heinrich Gustav Magnus, who became in the following year professor of natural philosophy in the University of Berlin. Magnus, having been a student in the laboratory of the great Berzelius, was of course of some experience as an analyst. This first analysis of a mineral wax, with his description as communicated by him in a letter to Humboldt, is to be found in the *Annales de Chimie et de Physique*, Vol. IV. (1834), page 217. He calls the substance "*Cire fossile de Moldavie*," and states:

"On boiling the fossil wax with ether or alcohol, even absolute, there is dissolved but a very small quantity, while the greater part remaining behind is, as it were, corroded."‡ His sample fused at 82° C. (= 180° F.). He says that, notwithstanding every care was taken, an excess appears in the analyses, which he explains thus: "On n'a pu éviter qu'une petite quantité de cire ne se volatilisât sans se décomposer." It is impossible to prevent a small quantity of the wax from volatilizing without decomposition. How this might cause a *deficiency* in the summation of the figures it is easy to see, but the contrary result certainly requires another explanation. Such explanation I have found by taking into consideration the date, which was previous to the discovery of the true equivalent of carbon by Dumas in 1841. Magnus used therefore—instead of the true figure, closely approximate to 12—some higher figure, nearer to that then employed by Berzelius, which was 12·26. This, of course, brought up his carbon too high. It is necessary, therefore, to resort to the actual weighings made by Magnus, and recompute them by the correct equivalent. This precaution must be observed in all cases of organic analyses published previous to 1841 or 42, and has had far too little observance in citing such analyses.

ANALYSES OF ZIETRISIKITE (DANA) BY MALAGUTI IN 1836, WITH RECOMPUTATIONS THEREOF.

	Weight of mineral.	CO_2 obtained.	H_2O obtained.	As computed by Malaguti.				As corrected by H. Wurtz.			
						Reduced to 100.				Reduced to 100.	
				C.	H.	C.	H.	C.	H.	C.	H.
1. Crude mineral	·212	·661	·262	86·21	13·71	86·28	13·72	85·034	13·732	86·097	13·903
2. " "	·289	·901	·369	86·2	14·16	85·891	14·109	85·028	14·187	85·701	14·299
3. " "	·3	·931	·371	85·8	13·98	85·9c9	14·011	84·637	13·741	86·033	13·967
4. Residuum after 14 successive treatments of the crude mineral with boiling alcohol	·301	·936	·383	.....	.....	.....	.....	84·807	14·138	85·711	14·289
5. " " "	·285	·884	·363	.....	.....	.....	.....	84·597	14·152	85·669	14·331
6. Distilled wax recrystallized from absolute alcohol	·261	·809	·334	.....	.....	.....	.....	84·535	14·215	85·601	14·399
7. " " " " " "	·303	·942	·392	.....	.....	.....	.....	84·781	14·375	85.504	14·496
Means				86·07	13·95	86·053	13·947	84·204	14·077	85·759	14·241
Means without No. 1 [which is too far from the mean]				86·0	14·07	85·94	14·06	84·066	14·135	85·703	14·297
C_nH_{2n} olefines				85·714	14·286	85·714	14·286	85·714	14·286	85·714	14·286
Paraffine $C_{25}H_{52}$				85·227	14·773	85·227	14·773	85·227	14·773	85·227	14·773

In this case the original weighings were: 0·2 gram of material gave

Water	0·2755, equivalent to	H = 0·03061
Carbonic acid	0·6205, "	" C = 0·169227
Sum		= 0·199837
Deducting this from		0·2
We get then, instead of a gain, a loss		= ·000163

This computes, in percentages, to

C	84·6135	which, computed to 100 =	84·68
H	15·305		15·32
	99·9185		100·00

If we had only this first analysis of Magnus to rely on, the species ozocerite of von Meyer and Glocker would, as above set forth, fall to the ground, as it plainly indicates a solid *paraffine* (such as produced and named three years before), of the constitution C_nH_{2n+2}, and comes near to dodecane $C_{12}H_{26}$, which contains

C	84·71
H	15·29
	100·00

Dodecane, however, is a *liquid* that boils at 392° F., and is the heaviest component of our better qualities of water-white kerosenes, constituting a large percentage of the Pennsylvania crude petroleum. My suggestion, to account for these figures of Magnus, which differ materially from most of the subsequent analyses of other mineral waxes, is based on the fact, stated by himself, of his inability to prevent the volatilization of a little of the mineral (or of oils produced from it), and their condensation in his chloride of calcium tube with the water. This would, of course, increase the apparent hydrogen. The loss, which ought in this case to have appeared in the results (as correctly computed), may have been due to imperfect drying before combustion. Indeed, the latter supposition would also account for the large hydrogen. One analysis, however, unless confirmed by others, counts for little. Magnus himself computes his analysis as follows:

C	85·75
H	15·15
	100·90

From which it is not plain sailing to discover what equivalent he used

* ENGINEERING AND MINING JOURNAL, issue of July 13, 1889, page 26.

†*Chem. News*, Vol. XXVIII., 101.

‡ "Est comme rongée."

for C, especially as his equivalent for O may not have been exactly that now in use. With C = 12·26 and O = 16, I compute this analysis to

C	85·94	C	84·883
H	15·305	H	15·117
	101·245		100·000

A curious circumstance is that in a paper of Malaguti, next upon my list, he erroneously cites this analysis of Magnus as follows:

C	85·75
H	13·15
	98·90

Magnus winds up his statement in the Humboldt correspondence as follows: "Sa composition se rapproche beaucoup de celle du gaz olefiant." Its composition approximates closely to that of olefiant gas. He thus regards it as CnH_2n. It must be remembered, however, that at that date little was known of the constitution of the true paraffines, or that there existed compounds constituted as $CnH_2n + 2$.

In 1836, three years after the publication of the results of Magnus, we have an investigation by the French chemist Malaguti, of another sample of mineral wax, from another locality in Moldavia. This was printed in the same journal, the *Annales de Chimie et de Physique*, Vol. 63, p. 390 (1836).

Malaguti's sample was designated as "Ozockerite de la montagne de Zietrisika," given to the "Museum d'Histoire Naturelle par M. Felix Bonjour." Its structure was foliaceous, its fracture conchoidal, its luster nacreous, and it was translucent in thin layers, presenting a greenish reflection. It had a little more consistence than beeswax, and a slight odor like petroleum. "Pour le frottement, elle étame le doigt, comme la résine." When rubbed it *tins* (or smears) the finger like a resin. It is very little soluble in alcohol and in boiling ether. Alkalies and solution of chlorine have no action, but a current of dry chlorine causes it to lose its hardness. It then becomes very soft and completely soluble in cold ether. Boiling nitric acid attacks it but feebly, but "warm sulphuric acid blackens the mass with evolution of sulphurous oxide and production of carbon, dissolving a portion, which water precipitates in black flocks."

It melted at 84° C. (183° F.) and its specific gravity was ·946. The heaviest artificial paraffine obtainable (from the Boghead mineral) melted at 176° and had specific gravity = ·94.§ Malaguti, in this investigation, was probably the first to indicate the method of separating intermixed homologous substances by means of fractional solution. He digested boiling alcohol of D. = ·814 in successive portions on the same mass of the mineral, extracting each time a fraction—which fractions rose successively in boiling point and density. He may even be said to have been thus the discoverer of the important fact that such bodies are often mixtures of series of homologues, which is generally attributed to Hofstadter¶ and Filipuzzi‖ at much later dates.

When Malaguti arrived at his *fourteenth* fraction he found that the alcohol was dissolving material of the same density and melting point as the residuum left undissolved. He, therefore, justly deemed that he had arrived at a homogeneous product. This product had a density of ·957, a fusing point of 90° C. (194° F.) and a boiling point of about 300° C. (572° F.) He made two analyses of this residual product, which are numbered 4 and 5 below. He also distilled a quantity of the Zietrisika wax, having found that it distilled over, at 572° F., without much decomposition. He purified the solid product of such distillation, and found this to be white, translucent, inodorous, of pearly luster, fusing at about 134° F. to a colorless liquid. It had a density = ·904. It was little soluble in cold ether, very soluble in boiling alcohol of density ·814, from which it *precipitated on cooling in amorphous flocks*. From a solution in absolute alcohol, however, it formed crystals. Of this distilled wax he made two analyses, numbered 6 and 7 below.

Before citing these analyses of *zietrisikite* (so called by Dana), to which the same remarks apply as made regarding that of Magnus, as to the necessity of recomputation from the original weighings, the very simple rules for such computations may interest some readers. To reduce the water formed in the combustion to hydrogen, multiply by $\frac{1}{9}$ or ·111111 +. To reduce the CO_2 to C, multiply by $\frac{12}{44}$ or $\frac{3}{11}$, or the coefficient ·272727 +. Those who prefer the equivalents of C and O, now widely in vogue (C = 11·97, and O = 15·96), may use for H the coefficient ·11135. For C, the fraction is, in this case, $\frac{11{\cdot}97}{43{\cdot}89}$, which (curiously) gives exactly the same coefficient as before: ·272727 +.

The carbon-equivalent used by Malaguti—as with Magnus—was a little less than 12 26. With O = 16, C = 12·23, I get close approximations from his weighings to his calculated percentages.

Malaguti, like Magnus, lays stress on the great difficulties (by the comparatively imperfect methods and apparatus then employed, of course) of obtaining complete combustion. He says the operation must be so slow as to occupy 2¼ hours in burning even a quarter or a third of a gram of substance. He specifies, moreover, that to dry the large bulk of CuO required, the combustion tube must be "exhausted of air many times at 120° C." (= 250° F.). This doubtless bears upon the larger proportion of hydrogen shown in the analysis of Magnus, as already suggested. In the table below only three of Malaguti's own computations are cited as samples.

In this table the special member of the paraffine series selected for comparison, $C_{25}H_{52}$ (see the bottom line of the table), is the one which Mr. Seal, in his recent communication referred to by me in your issue of 13th inst., considered as possibly the highest paraffine that would correspond to the sample of Utah ozocerite examined by him. It will be observed that Malaguti's figures for hydrogen all fall so far below this as to make it wholly incredible that they could have been obtained from it. Mr. Seal's *lowest* supposition, which he arrived at by the Raoult method was $C_{18}H_{38}$. He, however, obtained a depression of only one-tenth of a degree of congealing point—too narrow a basis to build much upon. But this supposition requires still more H, 14·96%. Even a 50-carbon paraffine would contain 14·53% of H.

On the other hand, the olefine percentages, on the second line from the bottom, will be seen to approximate very closely indeed in the hydrogen, and when the correctly computed results are reduced to 100, as in the last two columns of the table, the correspondence with the olefines will certainly strike the mind of any one who is not blinded by a determination to bend facts to his hypotheses. Further comments on these figures of Malaguti will be deferred until they can be compared with results of other analysts yet to be presented.

(To be continued.)

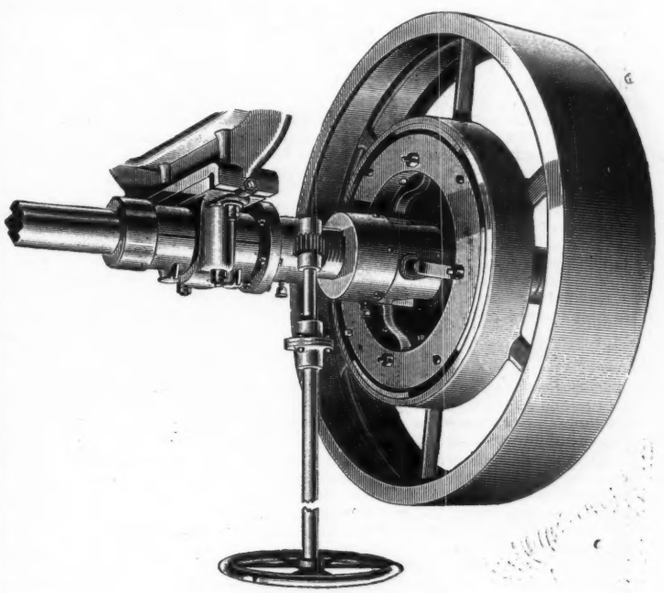
§ *Chem. News*, XXIV., 187.
¶ *Annalen der Chem. und Pharm.*, 91, 326 (1854).
‖ *Jour. für praktische Chem.*, 68, 60 (1855).

RICE'S FRICTION CLUTCH PULLEY.

The accompanying engraving illustrates a new friction clutch pulley recently invented by Mr. A. C. Rice, superintendent of the Stilwell and Bierce Manufacturing Company, Dayton, O.

The illustration shows the pulley attached to a shaft and thrown into gear. The clutch is shifted in and out by means of an upright shaft terminating in a pinion, which engages in a rack cut in the side of the shifter sleeve extension: this shaft is provided with a hand wheel, and may be extended so as to operate the clutch from above or below. The ordinary shifter fork and lever may also be used.

The clutch is provided with four metal friction shoes, which are simultaneously operated by the four crooked shifter arms. Each of these



shifter arms is fulcrumed on an eccentric bolt. The center of each friction shoe is out of center with its corresponding eccentric bolt: the effect of this is that when the friction shoe is thrown out against the friction rim, the shoe acts as a wedge, increasing the friction of the two surfaces, in proportion as the load is increased, thus preventing any slip. Each shifter arm is provided with an anti-friction roll running in the inclined slots in the shifter sleeve. These inclined slots terminate at both ends in straight slots parallel with the shaft, which serve to lock the shifter arms and, it is claimed, prevent all friction whatever on the shifter sleeve caused by centrifugal force when running, and consequently all tendency to throw in or out.

MANUFACTURE OF BASIC STEEL IN 1890.

The annual official statistics of the manufacture of basic steel by the Thomas-Gilchrist process for 1890 have recently been issued. They show that the total output of steel and ingot iron made from phosphoric pig amounted to 2,603,083 tons, being an increase over 1889 of 328,531 tons, and making the total production of basic steel since the commencement of the introduction of the process up to the end of last year, 13,448,000 tons. Of the total product of last year there were made by the basic Bessemer process 2,232,639 tons, and by the basic open-hearth process 370,444 tons. Of the basic Bessemer make 1,593,148 tons contained under ·17 per cent. carbon, and of the basic open-hearth make 298,867 tons contained under ·17 per cent. carbon. The United States figures in the returns for the first time. The makes of the various countries for the twelve months ending December 31st, 1890, and December 31st, 1889, respectively, are as follows:

	1890.		1889.	
	Total.	With under ·17% carbon.	Total.	With under ·17% carbon.
England	503,400	351,404	493,919	348,828
Germany and Luxembourg	1,493,157	1,138,241	1,305,887	1,060,416
Austria	202 315	114,857	175,755	124,907
France	240,638	175,550	222,392	159,271
Belgium, Russia and United States	163.573	111,963	76,599	71,217
	2,603,083	1,892,015	2,274,552	1,764,639

With these 2,603,083 tons of basic steel, there were produced some 623,000 tons of slag (containing about 36% phosphate of lime), nearly the whole of which was used as a fertilizer. There was a considerable falling off in consumption for this purpose, as 700,000 tons of slag were used in 1889.

THE NICKEL AND COPPER DEPOSITS OF SUDBURY, CANADA.*

By Robert Bell, B. A. Sc., M. D., LL.D.

The nickel and copper district of Sudbury, Ontario, is situated in the course of the best known and perhaps the longest Huronian belt in Canada. Beginning in the west, the general northerly boundary of this great belt commences at the promontory of Namainse on the east side of Lake Superior and runs approximately parallel to the shore of that lake, the St. Mary's River and the north shore of Lake Huron as far as Spanish river, leaving a border of Huronian rocks of varying width between the water and the Laurentian nucleus to the north. Near Spanish River the dividing line between the two systems turns inland and runs northeasterly nearly to Lake Wahnapitæ, whence it trends northward and northwestward till it gains a point lying northeast of Michipicoten on Lake Superior, thus almost surrounding a large elliptical area of Laurentian rocks.

The boundary between the Huronian trough and the Laurentian system along its southeastern side leaves the shore of Lake Huron at Shibaonaning (Killarney), runs to the foot of Lake Temiscaming at the great bend of Montreal River, and thence nearly to the southern end of Lake Mistassini, 335 miles due north of Montreal, or a total distance of 600 miles from the commencement of the belt on Lake Superior in a general course, or 700 miles, following the axis of the trough.

Within this Huronian region there are a good many inliers of gneiss and red quartz-syenite, some of which correspond with Laurentian types of these rocks, and it is uncertain whether they are protrusions of the older rocks from beneath, or whether some of them may not be portions of the Huronian itself which have undergone further metamorphism.

In the middle of that portion of the belt in which Sudbury is situated there is one of these inliers—a long tongue of gneiss and red quartz-syenite, which is joined to the main body of these rocks to the westward by dark gray, rather fine-grained, imperfect quartz-syenite and gneiss, which may be seen all around Wia-shai-gaming or Fairbank Lake.

The gneiss and the quartz-syenite of these isolated areas in the Sudbury district pass into each other, and are in many places broken up into separate bowlder-like masses, the interspaces being filled by a breccia with a dioritic paste, of which the fragments consist of the country rock or of a finer or pre-existing breccia of the same composition. This takes place over such considerable tracts as to suggest that these rocks may be underlaid at no great depth by diorite which was in a soft condition after the gneiss and syenite had been consolidated.

The strike of the Huronian belt, in the district under consideration, is northeast and southwest, and the rocks on the opposite sides dip at high angles toward the center. The rocks consist principally of graywackes and quartzites, various forms of diorites, quartz-diorites and hornblende schists, mica schists, diabases, argillaceous sandstones, black and drab clay slates, together with volcanic breccias, in addition to the gneiss and quartz-syenite already referred to. Those which occur in greatest quantity in the stratified Huronian belt between lakes Huron and Wahnapitæ, and which constitute the lowest members of the series, are quartzose graywackes and quartzites, with occasionally a little felsite.

In the graywacke and quartzite area of the region the crystalline diorites occur as numerous intruded masses, varying from half a mile to ten miles in length. They are of various forms, but their greatest diameters are approximately parallel with the strike. The rock is generally of a dark or sea-green color and moderately finely crystalline. Besides these massive diorites, bands of obscurely stratified varieties of the same rocks, of quartz-diorite and of dioritic and hornblendic schists are sometimes associated with the quartzites and graywackes.

Two long and remarkable intrusions of diorite of a gray color and coarse texture are found cutting the gneiss and quartz-syenite areas. They are each about a mile wide in the middle, run northeast and southwest, or parallel to the general strike of the stratified portions of the Huronian rocks nearest to them, and diminish to narrow points at the extremities. The first of these commences at Whitson Lake, in the township of Blezard, and runs southwestward into Denison, a distance of 24 miles, while the second has been traced from the northeastern part of Levack for about 18 miles southwestward. Most of the heavier deposits of nickeliferous ore, so far discovered, are associated with these two diorite belts.

The next member of the series above the quartzites and graywackes is a thick belt of nearly black volcanic breccia, which has been traced from Vermilion Lake northeastward to beyond the latitude of Wahnapitæ Lake. It is a compact silicious rock with conchoidal fracture and consists of angular fragments, mostly small, closely crowded together and flecked with irregular angular white spots, which consist of fragments of pumice, which, while retaining their structure, are completely replaced by silica. This band appears to be several thousand feet thick and forms an elevated and rough country along its whole extent.

The highest rocks of the series in this district, or those which occupy the center of the trough, are made up of evenly bedded drab and gray argillaceous sandstones or graywackes, interstratified with shaly or slaty belts, and overlaid at the summit by black slates. As these rocks dip at comparatively low angles, they occupy a greater geographical width than the other members in proportion to their thickness, which, however, must be very considerable.

The stratified Huronian rocks and also the gneiss and quartz-syenite of the Sudbury district are traversed by dikes of gray, coarsely crystalline diabase, which are often large and can be traced for considerable distances. Their commonest course is about west-northwest. They all have the same physical characters and appear to be of identical composition. The sound, fresh rock is extremely tough, but the exposed surfaces disintegrate easily under the weather into brown, crumbling débris, especially along the joint-planes and at their angles. The outer portions of the masses, thus separated, scale off concentrically, so that they become rounded and bowlder-like. These dikes apparently play an important part in the economic geology of the district.

Referring to the nickel and copper ores for which this district is becoming famous, there is much uniformity, both as to characters and the conditions under which they occur. These deposits are not confined to the undoubted Huronian rocks, but are equally abundant within the gneiss and quartz-syenite areas, and may be said to be connected with a certain geographical area rather than with a single geological horizon. The ore consists in all cases of a mixture of chalcopyrite and nickeliferous pyrrhotite. The area over which it has been found up to the present time extends from the Wallace mine, on Lake Huron, in the vicinity of La Cloche, northeastward to the north side of Lake Wahnapitæ, a distance of about 70 miles, and from the southeastern boundary of the Huronian belt, in the Sudbury district, northwestward to the limits of the Geneva Lake outlier, a distance of about 50 miles.

The investigations of the writer in this district have shown that the combined nickel and copper ore is found on or near certain lines of contact between diorite, and gneiss or quartz-syenite, but only at certain points on these lines, the concentration of the ore at one place more than another being probably caused by the intersection of the ore-bearing belts either by one of the diabase dikes above described or else from the pinching-in or perhaps from a transverse disturbance of the belt. The ore seems to have been derived in all cases from the diorite, but for some reason the proximity of the gneiss or quartz-syenite appears to be also favorable for the production of large deposits. In some cases the belts of diorite are much disturbed longitudinally, and mixed with other rocks showing lines of volcanic movement during their formation, and this condition of the diorite seems favorable for the production of the ore. The first of the two long, narrow intrusions of gray crystalline diorite before referred to, cuts off a narrow slice all along the southeastern border of the tongue of gneiss and quartz-syenite which lies in the middle of that part of the Huronian belt. The ore deposits of the Waddell, Dominion, Russell, Little Stobie, Murray, McConnell, Lockerby and McIntyre properties, lot 10, range I., Snider, the Crean and the mineral range of Denison appear to be all situated along the southeastern side of this diorite intrusion, or in its course, where it becomes narrow; while those of the Stobie and Frood mines and the other occurrences for two miles southwest of the former, of the Copper Cliff and others in the vicinity of the Evans, of lot 12, range III., of Graham, and of the Vermilion mine lie along the southeastern side of the separated slice of the gneiss and quartz-syenite range just referred to, and mostly within the diorite belt which skirts it on that side.

The various occurrences of the mixed nickeliferous pyrrhotite and chalcopyrite, as far as they have yet been opened up, resemble each other so closely that a description of one applies to all. They are associated primarily with the diorite masses which conform more or less with the general strike of the other rocks of the country. The older lines of fracture or disturbance are also approximately parallel with the strike, but their planes may incline at different angles from the local dip. The ore bodies take the form of stock works, following the direction of these ancient faults. The bodies are made up of a mixture of the country rock and the sulphides in the shape of a confused mass of coarse and fine fragments of the former, while the ore itself constitutes the matrix or filling between them. The fragments are of every size, from mere grains to great horses. Sometimes the smaller pieces are packed so closely together as to admit of the addition of only little ore, while at other times the interspaces are wide and allow the introduction of large quantities of solid ore. The chalcopyrite generally occurs in the midst of the pyrrhotite as distinct masses of irregular form, sometimes quite large, or in streaks and patches; but occasionally the two sulphides are more intimately mingled. In a part where the pyrrhotite prevails, an included fragment of the country rock may be coated with chalcopyrite, or the latter may lie as a bunch between the rocky fragments, and *vice versa* as to the other sulphide. There is no uniformity in their mode of occurrence with regard to one another, and they appear to have been introduced among the fragments of broken country rock simultaneously and under the same conditions. The dioritic wall rocks on either side and also the included bowlders and even the smaller fragments are often thickly impregnated with disseminated grains and patches of all sizes, both of pyrrhotite and chalcopyrite. These spots of ore have usually rounded outlines in cross-section and approach spherical and ovate forms. The two sulphides may occur side by side in the same isolated kernels or amygdules; but just as frequently the latter consist of one or the other alone, although in such cases the same rock section may contain as many of the one kind as the other and all indiscriminately mingled together.

Numerous analyses of the ores have shown that the nickel is confined to the pyrrhotite, in which it is present in the proportion of about 1% to 5%; but it has not been determined whether it replaces a corresponding proportion of iron uniformly throughout the mass or exists in the form of disseminated grains of polydymite. This mineral occurs as crystals, plainly visible in some of the ores from the Worthington mine, in the township of Drury.

*Abstract of an article in Bulletin Geological Society of America, February, 1891.

Contribution for Test Suit.—Where several persons have been induced on the same representations to buy stock from defendants, it is not maintenance or illegal support of litigation in which they have no lawful interest, for them to contribute to the expense of a suit by one of them to recover the money paid by him, as they all have a common interest in settling the question as to defendant's liability.

Davies v. *Stowell, Supreme Court of Wisconsin*, 47 *N. W. Rep.* 370.

Ocean Temperatures.—Ocean temperatures were the subject of discussion at a late meeting of the Geographical Society in London, says the *Engineering News*. Dr. Buchan, who has been for years investigating the meteorological aspects of the *Challenger* expedition, reported upon this subject. In the expedition mentioned, hourly or two hourly observations were taken of the atmosphere and surface temperatures; and other observations were made of sea temperatures at various depths. The result shows that the diurnal range of temperature at the surface of the open sea is a litttle less than 1° Fahr.; while the temperature of the air over the sea was about three times greater than that of the water surface, with greater diurnal variations. As to thunderstorms it was found that on land the maximum number occurred at mid-afternoon, when the air temperature was highest. On the open sea 70% of these storms occurred when the temperature was lowest.

OFFICIAL REPORTS.

Hecla Consolidated Mining Company.

The following is an abstract of the official report of the Directors of the Hecla Consolidated Mining Company for the year ending Dec. 31, 1890. The net value of the bullion and matte product of the company's smelting works was $627,087.57; to this also are added sundry cash receipts at the Glendale office, interest collected and allowance by Omaha and Grant Smelting and Refining Company amounting to $9,252.53, making the total receipts $636,340.10. The expenditures except dividends to stockholders amounted to $454,369.37, leaving a net profit of $181,970.73. Dividends to the amount of $122,500 were distributed among the stockholders during the year, making the total paid to date $1,560,000.

The cash balance in the treasury of the company December 31st, 1890, was $252,294.61. During the year 21,990 tons of crude ore were run through the dressing works, producing 2,395$\frac{76}{100}$ tons of concentrates, at a cost of $9,119.28, or 41$\frac{47}{100}$ cents per ton of ore treated. The assay value of the crude ore was 7% lead and 15 ounces silver; the concentrates assayed 35·3% lead and 51·5 ounces silver per ton; 10,918 tons of ore were smelted; 2,276 tons of lime rock and 4,245 tons of slag being used for fluxing purposes. The average assay of the furnace charge was 47·1 ounces silver, 35·6% lead and 28·4% silica: fuel cost, $3 per ton of charge.

The total product of the works was 4,298,176 pounds of lead, 159,981 pounds of copper, 480,904 ounces of silver, and 691 ounces of gold. The cost of mining per ton was about $5.60; 2,801 tons of second-class ore still remain in the bins at the various mines. In speaking of the prospects for the coming year, General Manager Knippenberg states that there are no reserve bodies of ore in the mines to fall back on, and that the future of the property depends upon developments in the territory at present unexplored. The company owns the Atlantic, True Fissure, Cleve and Avon, Cleopatra, Ariadne and Trapper claims. The Cleopatra produced most of the ore last year, 6,816 tons of first-class and 21,264 tons of second coming from it.

Quicksilver Mining Company.

The following is a statement of the earnings and expenses of the Quicksilver Mining Company, covering the period from Jan. 1, 1871, to Dec. 31, 1890:

Earnings.		Operating expenses.	
Quicksilver produced, 380,922 flasks, average net value, $36.249 per flask	$13,808,120.28	Pay rolls	$6,435,112.55
Miscellaneous	789,755.19	Miscellaneous and taxes	875,994.35
		Materials consumed in operation of mines and furnaces	2,056,239.99
		Balance	5,230,428.58
Total	$14,597,875.47	Total	14,597,875.47

The balance is thus accounted for: $1,092,122.97 have been disbursed in California for improvements in plant, real estate, litigation, etc., and $4,138,405.61 remitted to the New York office. The latter amount has been divided as follows: Interest on funded debt, taxes and expenses in New York, $716,963.81; first mortgage bonds, paid June 1, 1873, $500,000; second mortgage bonds, paid July 1, 1879, $1,000,000; dividends on preferred stock, $1,769,161.25; on common stock, $152,280.55. During 1890 dividends of $6 per share, amounting to $257,478, were declared on the preferred stock.

The production of quicksilver was 12,000 flasks, which came from 45,299,800 pounds of ore, the yield thus being 2·02%. In 1889 the total was 13,100 flasks, from 57,775,200 pounds of ore, or 1·73%. Since July, 1850, the production of the New Almaden mines has been 905,888 flasks, from 1,308,089,440 pounds of ore roasted. The average yield for all this time has been 5·35%. With the production of Enriqueta (from 1860 to 1863, 10,571 flasks), the total output of the company's mines is 916,459 flasks of 76½ pounds, or 70,109,113½ pounds.

These mines were first worked for quicksilver in 1845, but the operations were on a small scale, and no record exists earlier than 1850. They have been the most productive quicksilver mines in the world, excepting only the mine of Almaden in Spain. They are developed to a depth of 2,300 feet, and the workings extend horizontally over an area one mile square.

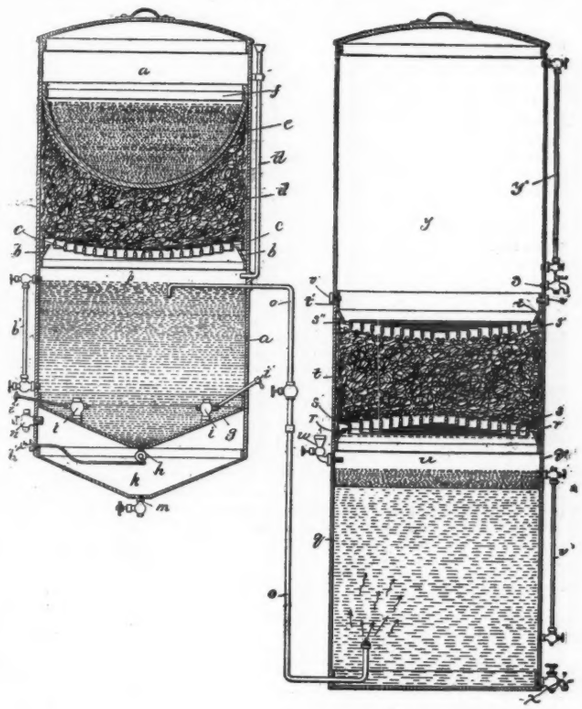
About 500 men find steady employment—the work being actively prosecuted throughout the year. From the 1st of January, 1864, to the 31st of December, 1890, the number of feet of drifting and sinking in the mines of the company, as shown by the records, amounted to 47·82 miles, at a cost of $2,131,872.28; this does not include the excavation made in extracting ore during the period named, nor any expenses for the same, while for the ground opened up during the previous period (from 1850 to 1864) 15 more miles of drifting and sinking can be added.

The reduction works consist of eight furnaces, include the most improved methods for working quicksilver ores, and may be considered as the most complete and perfect in every respect in the world.

Manufacture of Salt in China.—In China salt, which is a government monopoly, is obtained by the evaporation of the water of the brine wells which abound in certain districts of Sz-chuen The wells are found about 175 miles from Chung-king, on the bank of an affluent of the Yang-tze River, near the flourishing city of Tzu-lin-tsin. The manufacture of salt, which has been carried on here for sixteen hundred to two thousand years, is conducted somewhat as follows, according to a recent Consular Report: By means of a rude iron drill, holes 6 inches in diameter and varying from a few score of feet to 5,000 or 6,000 feet in depth are bored in the rock. The boring sometimes lasts for forty years before brine is reached, and is carried on from generation to generation. When brine is finally found it is drawn up by bullocks in long bamboo tubes by means of a rope working over a huge drum. In the vicinity of the salt wells, natural-gas wells are also found, from which gas is supplied to evaporate the brine in large iron caldrons, leaving the pure salt as a deposit. The product of salt in the district is enormous. There are twenty-four gas wells and about a thousand brine wells now in operation, producing annually 200,000 tons of salt, valued at $5,000,000.

JOHNSON'S OIL FILTER.

The accompanying engraving illustrates a new oil filter invented by James Johnson of Neenah, Wis., for separating from oil, after use in lubricating parts of engines or other machinery, the impurities which it may contain. It consists of two tanks, each of which is divided into two compartments by a removable grating, which supports a mass of filtering material composed of wool and cotton, in their natural state, thoroughly intermingled. On the top of this layer of wool is placed a thick woolen



felt, which is designed to catch and hold all of the coarser impurities, the felt being easily removed and cleansed or renewed. It is claimed that the mixture of loose wool and cotton beneath the felt is an improvement over ordinary felt or woolen cloth filters, as it does not become sodden, and thus likely to allow particles of grit or other impurities to pass.

In the bottom of the first tank there is a chamber to catch any impure matter that may have passed the first filtering layer. When the oil in this tank rises to the height of the outlet pipe it passes into the second, the bottom of which is filled with water to within a few inches of the second filtering layer. The clarified oil accumulates above the latter, whence it is drawn off. The water in the second tank is maintained at a constant level by an automatic regulating device.

Mexico's Exhibit at the World's Fair.—The Republic of Mexico, it is stated, will make a novel display at the World's Fair. It will consist of an artificial hill of iron, covered with terraced soil, surmounted by a fac-simile of the Castle of Chapultepec, and it will show the progress of Mexico from the time of the Aztecs. Temples, images and like scenes will be a feature of the exhibits at the base of the hill.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office:

TUESDAY, MARCH 10TH, 1891.

447,765. Roller Mill. Edward G. Dewald, Dayton, O.
447,779. Retort Furnace for Deoxidizing Ore. James H. Lancaster, New York, and Michael R. Conley, Brooklyn, N. Y.
447,820. Metal Planing Machine. George A. Gray and Ernst Richter, Cincinnati, O., Assignor to the G. A. Gray Company, same place.
447,824. Steam Hammer. Johann A. Henckels, Solingen, Germany.
447,865. 447,866. Steam Generator. James J. Bush, Newark, N. J., Assignor of one-half to Thomas F. Powers, Brooklyn, N. Y.
447,887. Appliance for Utilizing River Currents and Water Falls. Frank S. Martin, Hamburg, N. Y.
447,892. Hoisting and Conveying Apparatus. Thomas S. Miller, New York, N. Y.
447,895. Wire Nail Making Attachment. George W. McKim, Martin's Ferry, O.
447,910. Compressed Air Cylinder Lubricator. Henry C. Sergeant, New York, N. Y., Assignor to the Ingersoll-Sergeant Rock Drill Company, of New York.
447,926. Process of obtaining Bromine and Iodine. Herbert H. Wing, Buffalo, N. Y.
447,929. Compound Steam Engine. John Baird, New York, N. Y.
448,001. Compound Steam Engine. John Baird, New York, N. Y.
448,064. Hydrocarbon Burner. John McHale and Victor C. Dillmann, Kansas City, Mo.
448,073. Rolling Mill. James M. Price, Philadelphia, Pa., Assignor to the Price Railway Appliance Company, of Pennsylvania.
448,076. Smoke Preventing Water Tube Boiler Furnace. Thomas Reese, Jr., Newark, N. J., and Harry W. Seller, Brooklyn, N. Y.
448,085. Device for Spraying Oil from the Tubing of Oil Wells. Harvey F. Seybert, Queenstown, Pa.
448,156. Apparatus for Consuming Smoke and Saving Fuel in Furnaces. George Moffatt and Samuel Stuttaford, London, England, Assignors to the Vulcan Patent Smoke Consumer and Fuel Economizer Corporation (Limited), same place.
448,184. Steam Engine. William E. Good, Philadelphia, Pa., Assignor to the Southwark Foundry and Machine Company, same place.
448,189. Separator. Erastus S. Bennett, Denver, Col.

PERSONALS.

Mr. George B. Squires has resigned his position as assayer and chemist with the Omega Mining Company of Arizona.

Mr. R. E. Peary, Civil Engineer, U. S. N., it is stated, is making preparations to start upon a new expedition toward the North Pole through interior Greenland about May 1.

Mr. H. J. Bender, who is interested in mines in White Plains, Nevada, has just returned from a visit to Denmark, and passed through the city this week on his way to Nevada.

Mr. H. B. Gillespie, who is largely interested in mines in Aspen, Colo., and has been a resident of that place for many years, has removed to Chicago, which will be his home in the future.

Mr. F. E. Himrod, of this city, half owner of the Lamartine Mining Company, has been in Colorado for several weeks past looking after his interests. He is expected home next week.

Mr. George Faunce, formerly assistant superintendent of the works of the Pennsylvania Lead Company, has been appointed superintendent, vice the late Francis C. Blake. Mr. George A. Marsh succeeds Mr. Faunce as assistant superintendent.

Mr. Charles H. Gibson, mining engineer of this city, has returned from the Transvaal, Africa, where he has been on professional business. Mr. Gibson will leave for Chihuahua, Mexico, on Monday next, and will remain there for some time.

Mr. J. J. Ormsbee, who for several years has been the mining engineer of the Tennessee Coal, Iron and Railroad Company, has been appointed superintendent of the Thomas mines and coke works, which is one of the divisions of the same company.

Mr. George Scott, Jr., has resigned his position as general inside superintendent of the Wyoming division of the Lehigh and Wilkesbarre Coal Company, and it is reported will take charge of the work of driving the large drainage tunnel of the Jeddo Tunnel Company, Limited, Jeddo, Pa.

Dr. A. R. Ledoux, the well-known chemist of this city, has been invited to accompany the President and Directors of the Nicaragua Canal Company to visit the Isthmus to look into the coal properties which have been discovered on Lake Nicaragua, but has had to decline the invitation owing to other professional engagements.

Mr. E. L. Newhouse, E. M., of Pueblo, Col., who has been connected with the Philadelphia Smelting and Refining Company for some time, has purchased the public assay office of Mr. Albert I. Goodell and will continue the business. Mr. Goodell goes to Silver City, N. Mex., to accept a position with the Flagler Reduction Works.

Professor Charles Waldstein, the American archæologist, has had further success in his task of excavating hidden treasures from the ruins of Eretria, the city on the Island of Eubœa (Negropont), which was founded before the Siege of Troy, and which was destroyed 490 B. C. by the Persians. Professor Waldstein has found the ruins of a theatre, a number of graves, and treasures consisting of gold diadems, jewelry, vases, etc.

Mr. F. C. Von Petersdorff, who last year was an attaché of the California State Mining Bureau, left San Francisco early in February to take a position as superintendent of a gold mine in Mexico. Upon his arrival at Chihuahua he was placed under arrest by the authorities. Some seven years ago, Mr. Petersdorff, who is a citizen of the United States, while in Mexico, shot and killed an Indian who attempted to steal a bag containing money from which the laborers were being paid off at the time the affair took place. The matter was compromised by the Mexican government compelling Petersdorff to enlist in the Mexican army, from which he shortly afterward made his escape. Upon returning to Chihuahua, however, the colonel of his old regiment recognized him, hence his arrest as a deserter.

Mr. C. Le Neve Foster, Professor of Mining, and one of the Queen's Inspectors of Mines, delivered at the Royal College of Science, London, on January 19th, 1891, a lecture on the Progress of the Art of Mining (statistical review of the mining industry in 1890), in which he says: "Before concluding my remarks upon the United States, I must express my admiration of their journalistic enterprise. I refer to the "Annual Statistical Number" of the ENGINEERING AND MINING JOURNAL, of New York, dated January 3d, which reached me two days ago, giving very complete mineral statistics of their great continent. Knowing from actual experience the labor entailed in collecting and preparing such statistics, I can form some estimate of the difficulties that had to be overcome; and when a private firm accomplishes a task which no Government in Europe has ever thought possible, viz.: the publication of its mineral statistics within three days after the completion of a year, the meed of praise should be full and unstinted."

Governor Pattison, of Pennsylvania, has nominated the commissions to revise the mine laws of the State as follows: Anthracite—Martin McCormick, of Lackawanna (at large); John C. Kearney, of Lackawanna (First District); Michael E. Gibbons, of Luzerne (Second District); Edward Williams, of Luzerne (Third District); Anthony Reilly, of Luzerne (Fourth District); William B. Dowbrey, of Schuylkill (Fifth District); Patrick F. Brennan, of Schuylkill (Sixth District); Patrick Devers, of Schuylkill (Seventh District). Coal Operators—Lewis A. Riley, of Philadelphia; Thomas M. Righter, of Northumberland; William Connell, of Lackawanna. Mining Engineers—John R. Hoffman, of Schuylkill; John F. Snyder, of Lackawanna. Mine Inspectors—Samuel George, of Schuylkill; Hugh McDonald, of Luzerne. Bituminous—Andrew Hunt, of Allegheny (First District); Edward Bell, of Westmoreland (Second District); Robert Snedden, of Mercer (Third District); William B. Wilson, of Tioga (Fourth District); John Kirk, of Fayette; James W. Kilduff, of Cambria; William Barker, of Allegheny; John Band, of Centre.

OBITUARY.

Denning Duer, a member of the New York Stock Exchange since 1843, and at one time its President, died at Hawkhurst, N. J., on the 10th inst., in his 80th year.

Gustavus A. Rollins, of the firm of Rollins & Co., brokers, and a member of the New York Stock Exchange since 1835, died last week at Yonkers, aged 83 years.

According to a cable dispatch received from United States Consul Simons at Hong Kong, China, Senator P. G. Ballingall, president of the Coal Palace at Ottumwa, Ia., died at sea on the 7th inst. and was buried at Hong Kong.

William F. Potts, of the firm of W. F. Potts, Son & Co., wholesale iron and tin plate merchants, died in Philadelphia, Pa., last week, aged 77 years. For half a century he has been regarded as one of the leading business men of the Quaker city.

Alexander White, assistant treasurer of the Fairmount Coal and Coke Company and the Northwestern Coal and Iron Company, and secretary of the Niagara Falls & Lewiston Railroad, died in Buffalo on the 8th inst. He was born in the North of Ireland in 1847 and came to this country in 1867. He became connected with the coal companies twelve years ago, and by his strict attention to duty won the esteem of their officers and rose to the position of confidence which he filled at the time of his death.

SOCIETIES.

The Nova Scotia Institute of Mine Officials was organized at Maccan, Cumberland County, N. S., on the 17th ult. Its object is the reading and discussion of papers bearing on mining, and the interchange of views on new methods and inventions and all matters relating to the industry.

The American Institute of Electrical Engineers will hold its 55th meeting on Tuesday evening, March 17, at 8 o'clock, at the rooms of the Institute, 12 West Thirty-first street, near Fifth avenue. A paper will be read by Mr. J. J. Carty, of New York City, entitled: "Inductive Disturbances in Telephone Circuits." The discussion will be opened by Mr. A. E. Kennelly. Members who are especially interested in the subject may be supplied with advance copies upon application to the secretary.

The beginning of the second century of the American patent system will be celebrated by inventors and manufacturers of patented inventions at Washington, D. C., April 8th, 9th and 10th, 1891. The first public meeting will be presided over by the President of the United States, and at subsequent meetings addresses upon subjects appropriate to the intention of the meeting will be delivered by a number of distinguished speakers, including many eminent engineers and scientists. Owing to the limited capacity of the largest public hall in Washington, it is announced that admission will be by ticket only. Those intending to be present are requested to notify J. E. Watkin, secretary of the executive committee, 811 G street, N. W., Washington, D. C.

INDUSTRIAL NOTES.

California has appropriated $300,000 for a State exhibit at the World's Fair.

The Brooke Iron Company's No. 2 blast furnace, at Birdsboro, Penn., was blown out this week. The furnace had been in successful operation since November, 1888. It will be in operation again shortly.

The American Bridge Company has been organized in Chicago, Ill., to manufacture and sell wooden and metallic bridges; capital stock, $100,000; incorporators, J. Berger, A. B. Robinson, and George A. Robinson.

The Goodwins and Jardine Company, owning large steel works in Scotland, according to a dispatch from Glasgow, on the 9th inst. agreed, at a meeting of the stockholders, that the company should go into liquidation.

The Electrical Expert Company has been organized in Chicago, Ill., to manufacture electrical and other machinery and perform electrical engineering work; capital stock, $25,000; incorporators, Henry M. Wolf, Frederick G. O'Connell and Arthur A. Bliss.

The Taylor Electric Signal Company has been organized in Chicago, Ill., to manufacture and use electrical and mechanical devices for steam and street railways; capital stock, $500,000; incorporators, Charles H. Merrill, Frederick L. Merrill, and George W. Heath.

On April 1 the Joseph Dixon Crucible Company, of Jersey City, N. J., will begin the erection of new offices three stories high, 100 × 25 in dimensions. Their present offices will be used for factory purposes, together with a new addition 100 × 100, four stories high.

The Navy Department has asked for proposals for the construction of the protected steel cruiser of 7,300 tons displacement specially provided for in the Naval Appropriation Act of March 2d, 1891. All material used in its construction will be of domestic manufacture.

A banquet was given in Chattanooga on the 12th inst. to commemorate the first making of steel by the basic process in the South at Chattanooga. One of the courses was served on plates made from Chattanooga steel rolled at St. Louis and coated with tin from the Black Hills.

The Lidgerwood Manufacturing Company, of New York, Chicago and Boston, the well-known makers of hoisting engines, is now preparing a new catalogue which will contain illustrations of many new hoisting engines, and in which considerable space will be devoted to suspension cableways—a new feature of the business.

It was reported on the 10th inst. that 70 of the employés of the Lochiel Iron Works, Harrisburg, Pa., had been locked out, because of a meeting held on Sunday to protest against the reduction of wages. A number of the men were discharged, but the mill has not shut down. Work was resumed in both the finishing and puddle mills.

The B. F. Sturtevant Company, of Boston, Mass., has just issued a catalogue of 200 pages, descriptive of its blowers, heating and drying apparatus, portable forges, etc. It contains many tables and diagrams relating to the speed, pressure, capacities, and power required with the various classes of blowers, which are of considerable value.

The Standard Steel Company's works at Thurlow, Pa., are again in operation, the department in which the strike occurred having been filled with members of the Iron Moulders' Union and non-union moulders. The trouble originated through the demands of the members of the International Brotherhood of Machinery Moulders that no union other than their own should be recognized by the company.

The Chrome Steel Works, of Brooklyn, N. Y., has issued a useful pocket memorandum book, containing testimonials of its well-known adamantine shoes and dies, together with a diary, calendar, the postal regulations, and full text of the McKinley tariff law. The book has been sent to superintendents of all mines known to be in operation, and to any who may have been overlooked, it will be promptly forwarded upon request.

Messrs. Fraser & Chalmers the well-known manufacturers of mining machinery, of Chicago, Ill., have had plans prepared by Architects Raeder, Coffin & Crocker, for buildings on the 12-acre tract lying between Fillmore and Twelfth streets and Rockwell street and Fairfield avenue; work on the buildings will begin in a few weeks. It is proposed to erect 12 buildings which, with the necessary equipment and railroad switches in the yard, will cost $1,000,000. The railroad connections are of the best, as the tracks of the Wisconsin Central, the Chicago and Northwestern and Panhandle Railroads touch the property on its several frontages.

The Union Switch and Signal Company, one of the Westinghouse concerns, held its annual meeting at Pittsburg, Pa., on the 10th inst., and Mr. A. T. Rowand, secretary of the company and formerly considered as a firm friend of Mr. Westinghouse, nominated a complete board of directors in opposition to the old board, of which Mr. Westinghouse was chairman, and whose members expected to be unanimously re-elected. As Mr. Rowand held most of the proxies his candidates were elected as follows: Edwin Waters, W. Scott Fitz, and Sigourney Butler, of Boston; Henry C. Denny and Owen B. Jenkins, of Philadelphia, and G. P. Shane and A. T. Rowand, of Pittsburg. Mr. Rowand was subsequently elected president, an office held by Mr. Westinghouse since the organization of the company. The opposition have given formal notice that they will contest the election in the courts. They claim the proxies were sent Mr. Rowand to be voted for the old board.

SOUTHERN INDUSTRIAL NOTES.

(From our Special Correspondent.)

Lawrence S. Holt has built an addition to hi cotton mill, the Aurora, at Burlington, N. C. Th

present machinery will be increased to 46,000 spindles and 230 looms.

The Ellijay Land and Improvement Company has recently been organized at Ellijay, Ga., with a capital stock of $600,000, shares $100 each. Mr. A. E. Humphreys is president of the company. The principal office is at Charleston, W. Va.

A. Hegewisch, receiver of the United States Rolling Stock Company, has instructed the National Bank at Anniston, Ala., to draw on him for the amount necessary to pay the creditors of the Rolling Stock Company. The amount due is about $90,000. This payment releases the Anniston works.

The Atlanta Machine Works, at Atlanta, Ga., were reorganized several months ago, with Mr. L. H. Belk president and Mr. John Cary secretary and treasurer. The buildings have been remodeled and improved machinery has been put in. The company reports considerable increase in its business. It makes a specialty of the improved absorbtion ice machine, steam boilers, saw mills and gold mining machinery.

A syndicate of capitalists, among whom are A. Frierson, of Chattanooga, Tenn., and G. Latham, of St. Louis, have bought the greater part of the unimproved property of Dalton, Ga. The price paid is reported as being $600,000. The property comprises over 2,500 acres, upon which are several stores and public buildings. The new company will be known as the Dalton Development Company. Its object is to build up a manufacturing city at that place.

The Perpetual Investment, Construction and Deposit Company, organized about two months ago at Richmond, Va., with T. P. Campbell president and David W. Reinhardt secretary and treasurer, has an authorized capital of $2,000,000. The secretary informs us that they are meeting with considerable success, and their stock is being sold rapidly; the purpose of the company is to develop East Richmond. Three factories have been secured so far; one woolen knitting mill, employing 50 hands, is in course of construction, and will be completed in 60 days; brass works and builders' hardware factory, to employ not less than 500 hands, and a sewing machine factory that will have a capacity of 50 machines per day, are contracted for.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office. No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

2,104. A lathe outfit. Tennessee.

2,105. One-arm sander, one 30-inch resaw, one 4-inch molder, one single-headed tenoner and a No. 2 mortiser. Virginia.

2,106. A small amalgamator of sufficient capacity to handle from one to ten pounds of ore. Minnesota.

2,107. Engine, boiler and everything to equip a first-class incline at Lookout Mountain. Tennessee.

2,108. Two miles 30 pound steel rails, spikes and plates necessary to lay the same. Georgia.

2,109. One standard locomotive. Price f. o. b. Wenona, Georgia.

2,110. An apparatus for heating a house and a conservatory. Tennessee.

2,111. Bids, estimates, etc., for the construction of a complete system of water-works. Georgia.

2,112. Machinery for a complete plant for gold mining. South Carolina.

2,113. Complete plant for hydraulic gold mining. South Carolina.

2,114. Water wheels for mining purposes. South Carolina.

2,115. An overshot water wheel, of cast iron, shaft and the other machinery necessary to run a cotton gin and grist mill. Water wheel to be about 20 feet in diameter. South Carolina.

2,116. Electrical outfit for 200 sixteen candle-power incandescent lights and 2,000 ten to fifteen candle-power arc lights and wiring; want but one dynamo. North Carolina.

2,117. Second-hand wrought iron pipe 24 to 30 inches diameter. Connecticut.

2,118. A second-hand core drill with core 2½, 3, or 4 inches. Virginia.

2,119. Riveters, rolls, lathes, punches, and testing machines, for boiler works. Pennsylvania.

2,120. Two 50-H. P. engines and boilers for machine shops. Ohio.

2,121. Improved office equipment for a large mining, importing and manufacturing concern. New Jersey.

2,122. A 6-foot boring mill, a 6-foot pulley lathe, a 20-inch × 16-foot bed lathe, a pattern maker's lathe, and band saws. Georgia.

2,123. A cheap furnace for smelting lead ore (carbonate). Tennessee.

2,124. Three hundred and fifty squares fireproof roofing other than slate, suitable for foundry, machine shops, etc. Pitch sufficient for any kind of roof. Ohio.

2,125. Catalogues and prices of bath tubs, fixtures and bath room supplies. South Carolina.

2,126. Iron fronts, iron roofing, elevators, office fixtures, etc. South Carolina.

2,127. A second hand, surveyor's transit, either hire or purchase. Florida.

2,128. Silver plating machine. Ohio.

2,129. A complete core drill outfit for prospecting in Indiana oolitic stone region. Illinois.

2,130. Derrick and hoisting engine. Illinois.

2,131. Stone channeler. Illinois.

AMERICAN GOODS WANTED ABROAD.

2,093. A good second-hand mill for free silver ore, wet crush, 5 or 10 stamps. Mexico.

2,094. A brick machine, to be driven by belt from steam engine, for at first making common brick, and afterwards for bricking fine ore and flue dust, preparatory to its being smelted in a blast furnace. Mexico.

2,095. A lot of water pipe and fittings. Mexico.

2,096. Tools for cutting and threading pipe and bolts. Mexico.

2,097. Shovels.

2,098. Wheelbarrows. Mexico.

2,099. Scales for weighing cars, wagon platform, wheelbarrow and charge scales. Mexico.

2,100. Blacksmith tools. Mexico.

2,101. Boilers and engines. Mexico.

GENERAL MINING NEWS.

In a recent decision by Secretary Noble in a South Dakota case, he held that "stone that is useful only for general building purposes does not render land subject to appropriation under the mining laws, or except it from pre-emption entry." Many applications under the mining laws heretofore filed in the different land offices will find in this decision a very formidable obstacle to patenting; and, indeed, several such applications have already been held for cancellation under this decision.

ALABAMA.

CHEROKEE COUNTY.

(From our Special Correspondent.)

DE BARDELEBEN COAL AND IRON COMPANY.—This company is making preparations to develop the Frog Mountain ore banks near Spring Garden. The company purchased the mountain last summer for the sum of $100,000. One of the engineers has been examining the iron ore at this place, and pronounces it to be as good as any in Alabama. The advisability of erecting a furnace at Frog Mountain for this ore is being considered.

ETOWAH COUNTY.

(From our Special Correspondent.)

On petition of the East Tennessee, Virginia & Georgia Railroad Company, Judge Bruce, of the United States District Court, on the 7th inst. appointed a receiver for the Gadsden Furnace Company, of Gadsden, Ala. Mr. T. H. Aldridge, president of the Cahaba Coal Mining Company, was appointed receiver with instructions to keep the furnaces in operation. The amount due the railroad company is $16,500.

JEFFERSON COUNTY.

(From our Special Correspondent.)

In the Birmingham district water has kept several mines idle for some time. The Henryellen and the South Birmingham coal mines suffered most. The South Birmingham miners have been idle for nearly six weeks, and have just gotten to work again.

RANDOLPH COUNTY.

(From our Special Correspondent.)

Considerable excitement is reported just south of the Cleburne County line, in regard to recent discoveries of gold ore. It is reported that a company is preparing to work the property, which is located in the vicinity of Pinetucky.

ALASKA.

ALASKA TREADWELL GOLD MINING COMPANY.—During January this company milled 17,700 tons of ore and treated 582 tons of sulphurets. The bullion yield of the latter was $24,000, and the total bullion shipments $66,000. The expenses were at the normal monthly rate, $27,500. The mill was in operation 26 days. This company is a reorganization of the Alaska Mining and Milling Company. The latter paid $650,000 in dividends to January 1st, 1890. The new company paid its first dividend, 25 cents per share, amounting to $50,000 in November, 1890, and its second in January last.

ARIZONA.

MARICOPA COUNTY.

WINNIFRED GOLD MINING COMPANY.—Fifteen men are working on the claim of this company, which is located about 15 miles north of Phœnix. The 80 and 120 foot levels are being driven ahead on ore that runs from $15 to $300 per ton. A 10-inch streak of free-milling gold ore averages $120 per ton. Superintendent Nicholson is reported to have said that the company intends erecting a Huntington mill on the Arizona Canal next May. In addition to the free ore there are great quantities of sulphurets that can be worked at a profit.

PINAL COUNTY.

HOWARD.—It is reported that an addition of two tables is being made to the mill. This, when complete, will make the capacity of the mill something like 13 tons a day. The Howard is an old mine worked for many years, and a large mill has been burned at the site of the present one. The shaft is some 40 feet in depth, but is now badly caved in and full of water. A new shaft is being sunk 600 feet north on the same lead, and will be sunk 100 feet. Much of the work of the mill will be done on ore on the dumps where there are large quantities which were deemed too low grade for working.

PIMA COUNTY.

TUCSON COPPER COMPANY.—It is reported that the Tucson smelter will be started up as soon as coke now on the way shall have arrived. The company in charge of the smelter consists of Messrs. Phillips and Everson, from Sacramento, Cal., and Col. J. K. Gooding. The ore to be worked is copper only, and comes from the company's own mine situated at Silver Bell. The ore runs an average of 12¼% copper, and there is now on the dump some 4,000 tons. Twenty men are to be at once set to work in the mine. At the smelter the work of clearing out débris and repairing the damage done to the furnace and building by the flood of the Santa Cruz last August is being pushed with all vigor.

GRAHAM COUNTY.

SAN FRANCISCO, March 5.

(From our Special Correspondent.)

The news has been received from Clifton that the loss caused by the recent floods will aggregate about $100,000. The principal destruction has consisted of the homes of laborers, the dam and flume of the Arizona Copper Company, the pumps of the Copper King Company, the dam of the Detroit Copper Company, the approaches of the Arizona & New Mexico Railway, the bridge across the river and the iron bridge at Guthrie, across the Gila, etc. The Arizona Copper Company and the Arizona & New Mexico Railroad Company will be the heaviest losers. It will be some time before the various companies can repair all damage done.

CALIFORNIA.

AMADOR COUNTY.

HARDENBURGH MINING COMPANY.—It is stated to be the intention of this company to put up a 15-stamp mill. The stamps of the old mill now on the claim will be utilized in the new structure. The mill is to be put up near the shaft, and is well located for water power. James White, who superintended the construction of the Amador mill, will have charge of this undertaking.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—This company's Eastern office, 120 Broadway, New York, is in receipt of the following news from the mine: "The upraise is 35 feet above the tunnel. The vein is 2 feet wide and carrying high-grade ore."

COLORADO.

ARAPAHOE COUNTY.

EUREKA GAS AND OIL COMPANY.—It is reported that this company has cut a vein of bituminous coal 20 feet thick at a depth of 950 feet, in the well which it has been sinking at Plum Creek, five miles below Littleton. The company was prospecting for natural gas and petroleum, and had already expended $50,000 in the work. It is probable that preparations will now be made toward sinking a shaft to open the newly found coal bed. The company has made application to the Colorado Mining Stock Exchange to list 70,000 shares of its treasury stock, to raise money for the further prosecution of its work. If the new discovery proves to be valuable it will be of great importance, as its locality is only a few miles from Denver.

HINSDALE COUNTY.

UTE & ULA MINING COMPANY.—This company is at present producing from 400 to 600 tons of ore per month, and it is expected that shipments will be considerably increased before summer. A force of 150 men is at present employed in the mine and mill. Lack of water for jigging purposes and for the air compressor, caused by the numerous snowslides in Henson Creek, has of late interfered with operations to some extent, but the trouble is only temporary.

LAKE COUNTY.

ANTIOCH MINING AND MILLING COMPANY.—The new tunnel commenced in this property about February 1st is now in over 150 feet. This tunnel, which is on the same level as the stamp mill, will cut the vein at a depth of about 600 feet and will be 1,600 feet in length. Hitherto the ore has been brought down from the upper tunnels by means

of the gravity tramway. The mill is at present closed down and, it is reported, will not resume work until the new connection is made.

REED & NATIONAL MINING COMPANY.—This company is working thirty men at present in the mine. A contract has been let to sink the main shaft 70 feet deeper, and also to sink a new shaft on the north end of the property, near the line of the Amity Mining Company. Arrangements are said to have been made to enlarge the capacity of the mill from 40 to 100 tons per day. During the next three months $20,000 is to be expended in further development work, and active stoping will not be commenced again until this is completed.

OURAY COUNTY.

SARATOGA MINING AND MILLING COMPANY.—The new leaching mill of this company, which was put in operation in January, has been closed down for the want of suitable fuel. L. R. Fry, the manager of the company, states that the Durango coal used proved unsatisfactory, and is now endeavoring to make a contract for 1,000 cords of wood. It is probable that work will be resumed soon after the first of next month. In this mill the Patera process is used, and during the short run made it was demonstrated to be perfectly suited to the ore. The ores worked so far have averaged 16 ounces and 25 ounces silver per ton.

PARK COUNTY.

EMMONS MINING COMPANY.—At the annual meeting of this company in Denver on the 2d inst. the following officers were elected: George F. Batchelder, president; Scott Weber, vice-president; F. R. Miller, secretary, and E. E. Graves, manager. English parties have an option on the capital stock of this company at $1,000,000, extending until May 1st, and it is now said that the sale is likely to be consummated. The Emmons Mining Company, which is a reorganization of the Bannon Mining Company, owns a large amount of property consisting of 31 claims in the Horseshoe district, which is about eight miles from Leadville, on the other side of the Park range. The ore-bearing formation in the two districts is similar. The Emmons has produced comparatively little ore as yet, but several mines with very good prospects are said to have been opened in its property.

PITKIN COUNTY.

JUSTICE MINING COMPANY.—A new ore body was recently discovered in this mine in sinking a winze at a point about 100 feet southwest of the shaft. A level that was being run to open this ground has broken into a cave, found to be 125 feet long, 40 feet high and in some places 30 feet wide. It is very irregular, and there are several breaks in the floor. Both walls of the cave are lined with ore, which is of medium grade. The extent of the deposit has not yet been ascertained, as it has been necessary to do considerable preparatory work before any prospecting could begin. There are indications, however, of the existence of a large body of ore in the floor of the cave.

MOLLIE GIBSON MINING COMPANY.—This company has now commenced stoping in the rich ore chute opened, all ore hitherto shipped having come from development work alone. It has now been demonstrated that the ore body lies in a chute with northeast and southwest trend, it having been cut by levels 2, 3 and 4. There had been some doubt regarding its continuity, as it had been missed by the third level. By exploration with the diamond drill, however, it was found that this drift had run beneath it. The ore body that has now been uncovered is probably one of the most remarkable ever opened in Aspen. The distance between the third and fourth levels is 100 feet, and in this the chute is said to have an average width of 35 feet, thickness of 5 feet, and assay 2,000 ounces silver per ton. As exposed in the third level, there is one streak of 14 inches thickness that assays 12,000 ounces silver per ton. In running the raise from the fourth level through the ore $85, 00 was taken out. The Mollie Gibson Mining Company is capitalized at $2,000,000 in 1,000,000 shares of $2 each. The stock was formerly listed on the Colorado Mining Stock Exchange, but as withdrawn. It is now quoted in Aspen, however, at above $1 per share.

STANDARD MINING COMPANY.—This company filed suit in the Circuit Court at Denver on the 28th ult. against the Cowenhoven Mining, Transportation & Drainage Tunnel Company to recover possession of the portion of the Chatfield lode occupied by the tunnel company, and $3,000 damages. The Standard Mining Company, owner of the Chatfield lode, had given the tunnel company right of way through it, upon certain conditions set forth in a contract between the two parties. It is now claimed that these have not been fulfilled. The Standard Mining Company also entered suit against the Della S. Mining Company on the 2d inst. to eject the latter from its property on the vein of which the Standard claims to have the apex. The Della S. claims lie to the west of the Standard, and the vein has been opened in them by a crosscut 250 feet in length from the Cowenhoven tunnel. In the J. C. Johnson mine, owned by the Standard Company, no attempt is at present being made to produce more ore than is sufficient to meet operating expenses. Exploration work is constantly increasing the amount of ore reserves.

(From an Occasional Correspondent.)

HOLDEN SMELTING AND MILLING COMPANY.—Messrs. Salkeld and Behr and C. A. Stetefeldt have completed the plans of the mill for this company, which will be erected during the present year at Aspen. The plant is specially designed for the Russell process, for which the above-named company has secured the exclusive right at Aspen. The plans cover 59 sheets, many of the diagrams being original and new. Three Pelton wheels will furnish the power: one for the crushers and sampling-mill, one for the battery and auxiliary plant, and one for the electric-light dynamo. Four of Stetefeldt's shelf-drying kilns and one large Stetefeldt furnace will be fired by gas, made in two Taylor gas-producers. The crushing plant consists of 30 stamps, 850 pounds each, for ore, and 10 stamps, 450 pounds each, for salt. It will have a minimum capacity of 100 tons of ore per day, but may reach a much higher figure, depending on the size of screens that can be profitably used on the battery. There are six ore vats 17 feet in diameter and 9 feet deep; six precipitating tanks 12 feet in diameter and 9 feet deep, with screw-propeller stirrers; two storage tanks with sulphides, two solution sumps, and two storage tanks for stock solution. The hyposulphite solution will be elevated from the solution sumps to the storage tanks by compressed air, using the Montejus system. An Ingersoll air compressor will be used, in connection with a press tank, for charging the sulphides into a Johnson filter press, at a pressure of 150 pounds per square inch. The drying chamber for sulphides is of new construction. This will be the largest and most complete lixiviation mill so far erected in the United States. Between 500,000 and 600,000 feet of lumber will be consumed in the construction of the mill and buildings, the latter covering an area of 27,200 square feet. These figures do not include the crusher and sampling house and the buildings over ore beds. Estimates on the total cost of the mill have not yet been made. Some may, perhaps, wonder why the Aspen mill has been provided with stamps and not with rolls, knowing how strongly Mr. Stetefeldt has advocated the use of Krom's rolls for lixiviation works. The facts are as follows. About 65 tons of Aspen ore were treated at the Ontario mill, and the results being very satisfactory to the Holden syndicate, both regarding the performance of the battery and the extraction of silver by the Russell process, they preferred to adopt stamps in place of rolls.

SAN MIGUEL COUNTY.

GOLD KING CONSOLIDATED MINING COMPANY.—Connection was made by the two headings of the large tunnel, which this company has been driving during the past year, last week. One end was commenced in the lower level of the Gold King mine and the other in the Golden Chicken claim, 2,600 feet distant. The tunnel forms level No. 7 of the mine. It will now be used as the main working adit, a tramway connecting its mouth with the stamp mill. Mr. James Campbell, of this company, denies that this company has entered the consolidation of gold properties in this county, under the title of the San Miguel Consolidated Mining Company.

SUMMIT COUNTY.

BOSS MINING COMPANY.—This company's mine, which is now being worked under lease, last week produced 127 ounces of gold from five men's work, and in the previous week 106 ounces. The mine is located on a series of the small slate veins on Farncomb Hill, in Breckenridge. The country rock here is slate, which is cut by an immense porphyry dike, carrying a small amount of gold. In the slate immediately adjoining this dike, the joint seams are highly mineralized to a width of one or two inches, the ore being iron-stained clay, assaying from $200 to $300 per ton in gold. Frequently, however, this vein matter is replaced by a slab of almost solid gold, which have been found weighing as much as 50 ounces. Very beautiful specimens of crystallized gold are also found in these mines. The gold in the clayey vein matter is recovered by panning and amalgamating the concentrates in mortars. The operation of these mines is very uncertain, but at times quite profitable.

FLORIDA.

The Charleston *News and Courier* quotes a prominent business man of that city, who has been on an extended visit to the "land of flowers," as saying that the boom in Florida phosphates is unprecedented, the total amount of money invested in lands since the rich deposits were discovered being estimated at over $22,000,000. Between $650,000 and $700,000 of Charleston capital is included in this estimate.

GEORGIA.

TOWNS COUNTY.

(From our Special Correspondent.)

LEDFORD CORUNDUM MINES.—These mines, located three miles west of Hiawassee, were sold some time ago to Mr. Hamilton, of Athens, Ga., on condition that they should be developed, and, if proved good, should be purchased on March 1st. A force of hands were at once put to work developing the property and the corundum being found in sufficient quantities the trade was closed on the 5th inst., the purchase money being $8,000. A company has been formed to work the mine, and several buildings have been erected on the property. The quality of the mineral is said to be good.

IDAHO.

ELMORE COUNTY.

PINE GROVE MINING COMPANY.—This company has recently been reorganized, and is now in charge of a number of practical St. Louis business men who propose to work the property on its merits. New surveys of the claims seem to indicate that the last superintendent was not on the lode which has such a fine cropping, but had been running on a small parallel vein. It is reported that Elmer C. Towne, a practical miner and a thorough engineer, has been engaged as superintendent. The principal work will be done on the Gold Hill claim.

SHOSHONE COUNTY.

BLACK CLOUD.—This property is developed by over 2,500 feet of tunnels. All the workings are connected, so that the ventilation is very good. The lower tunnel is in 800 feet, and was intended to cut a vein, the heavy croppings of which can easily be traced near the top of the hill. This ledge has been worked in upper levels, turns toward the Monarch, has perfect walls, and varies in width from four to seven feet. It was on this that the first work on the property was done. The claim runs up the hill, and is so located that it takes in about 1,100 feet of the California ledge. A great amount of work has been done on this, showing ore in large quantities. The Black Cloud has been worked with the intention merely of showing up the deposit, and no ore of any consequence has yet been stoped.

CŒUR D'ALENE SILVER-LEAD MINING COMPANY.—The snowfall of the past two weeks has been very heavy, the railroad has been unable to reach Burke, and the supply of wood at the Poorman mine is almost used up. Manager Clark is reported to have said last week that unless wood was secured he would have to put the fires out and lay the men off. The same state of affairs exists at the Tiger mine, and will result in the flooding of the mines unless it is relieved. It is said to be within the power of the Northern Pacific Railroad to do so. The Union Pacific is running to the lower edge of Burke, but is enjoined or prevented from running to the Poorman concentrator by the Northern Pacific. The attorneys for the Poorman have been instructed by Manager Clark to apply for a restraining order against the Northern Pacific, preventing it from interfering with the Union Pacific and allowing the latter to run its cars to the Poorman mill.

FORMOSA.—For several months past a force of men has been at work on this claim, located on the south side of Cañon Creek. The claim is owned by J. J. Ullman, E. Dessauliner, Robert Bradley and John Gleason. A tunnel has been run about 200 feet to crosscut the ledge, which is reported to have been encountered recently. The ore is galena, and gives every promise of being a big, strong vein, although its width has not yet been determined. The Formosa was formerly called the Treasure Box, was owned by Charles McDonald and considered comparatively valueless.

KANSAS.

A special report shows that during the week ending March 7th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 1,641,380; zinc ore, pounds sold, 696,490; lead ore, pounds sold, 49,876. Sales aggregated a total value of $12,023.

MICHIGAN.

COPPER.

ALLOUEZ MINING COMPANY.—The reconstruction of the burned rockhouse at this company's mine is now under way. Under ground there are five drills at work drifting. A sixth machine is raising from the twelfth to the thirteenth level.

ATLANTIC MINING COMPANY.—The annual meeting of this company was held at its Eastern offices, at 76 Wall Street, New York, on the 11th inst. The principal business transacted was the re-election of the officers and directors as follows: Joseph E. Jay, President; John Stanton, Secretary and Treasurer; Edward H. Mead, John R. Stanton; Isaac P. Crane, Albert S. Swords and Samuel L. Smith. The advanced statement of the company's annual report will be found in another column of this issue.

CALUMET & HECLA MINING COMPANY.—The Marquette *Mining Journal* states that the broken shaft of the pumping engine "Wahbeck" has been repaired. The new sand wheel was about ready to start up when it was discovered that, in making the plans, the running of the wheel by an auxiliary engine had been overlooked. This necessitated some changes in the machinery, which are now being made. The new pumping engine "Michigan" is expected to be ready for service by May 1st. Steam will be turned on about the middle of next month.

CENTRAL MINING COMPANY.—AN ENGINEERING AND MINING JOURNAL reporter learned from Mr. John Stanton, secretary and treasurer of this company, that active operations are being carried on in the territory traversed by the Northwest vein

(See ENGINEERING AND MINING JOURNAL, Jan uar

24th, 1891). There are two parallel veins on which drifting is being done. They are found to carry copper, but not in workable quantity. But little opening has been done, and for this reason it is difficult to determine which of the two is the Northwest vein. As is characteristic of veins in this formation, both are very irregular, and may be found to run together. They lie in a channel of ground in which Central mine was productive. The output of the mine for the month of February was 65 tons, as against 80 tons for January; the outputs for the corresponding periods of 1890 were 73 and 75 tons respectively. The lower levels of the mine are said to be looking a little better.

OSCEOLA MINING COMPANY.—The annual meeting of this company was held in Boston on the 12th inst., 34,226 shares being represented out of the total of 50,000. The old board of directors was re-elected, with the exception that Mr. J. Henry Brooks was elected in the place of Mr. Joseph W. Clark, resigned. The new officers are Mr. A. S. Bigelow, president; Thomas Nelson, treasurer; A. S. Bigelow, John N. Denison, Charles Van Brunt, Gustav Stellwag and J. Henry Brooks of Massachusetts, Leonard Lewisohn of New York, and John Daniell of Michigan, directors. The annual report for the year 1890 shows the following results of operations.

The product of mineral was 6,169,686 pounds, which at 85·82 per cent., gave 5,294,792 pounds of refined copper, for which has been realized the gross sum of	$821,391.84
From sale of building lots, houses, etc., at Hancock	6,363.00
Silver sales	1,238.74
	$828,993.58
Costs—	
Running expenses at mine	$440,126.67
Smelting, transportation and all other expenses of selling copper	79,836.43
Expended in mine plant	75,156 19
	595,119.29
Net income for the year	$233,874.29
Dividends Nos. 26, 27, 28 and 29	225,000 00
Surplus for the year	$8,874.29
Balance assets Jan. 1, 1890	209,746.22
Balance assets Jan. 1, 1891	$218,620.51

The assets are given as $348,030.58, the liabilities $129,410.07. This summary of operations is given: Rock stamped, 183 825 tons; product of mineral, 6,169,686 pounds; product of refined copper, 5,294,792 pounds; yield of refined copper per ton of stamp rock, 28 80 pounds; yield of refined copper per cubic fathom of ground broken, 444 pounds; yield of mineral per cubic fathom of ground broken, 518 pounds; percentage of mineral in stamp rock, 1·68; percentage of refined copper in stamp rock, 1·44; cost per ton of rock hoisted, $2.05; cost per ton of rock stamped, $2.39; refined copper, cost per pound at mine, 8·31 cents; cost of smelting, freight and all other expenses of handling copper, 1·51 cents; cost per pound of refined copper for the year, excluding construction, 9·82 cents; cost per pound for the year for construction, 1·42 cents; total cost per pound, 11 24 cents.

The report of Captain John Daniell, the superintendent, says that stamp rock costs $2.39 per ton to manipulate—18 cents more than the preceding year. Increased wages paid accounts partly for the difference, and there were heavy expenditures putting Opechee or No. 5 shaft in order for regular work. For the current year better figures will be made, as the mine is now better equipped than ever before, and a larger quantity of rock will be handled. The plant is in good condition, and ample for present needs. Compared with a year ago, there is no falling off underground, and everything is running regular. A larger increase for the current year over 1890 is expected than was recorded over 1889.

GOLD.

(From our Special Correspondent.)

MICHIGAN GOLD COMPANY.—The results of the milling of 600 tons of rock from the Michigan mine are unsatisfactory to the directors, and the work was stopped after that amount had been treated. Care had been exercised to select an average grade of rock. It had been intended originally to treat 1,200 tons, but the yield was too poor to justify the expense. A special meeting of stockholders will probably be held at an early date, and a course of action for the future will be determined upon. There is considerable good stoping ground in the mine which can be worked out at a profit before the mine is abandoned, if that course is determined upon.

ROPES GOLD AND SILVER COMPANY.—The annual meeting of the stockholders of this company was held in the secretary's office at Ishpeming, on Monday evening, March 9. Of the 80,000 shares 29,138 were represented. Julius Ropes, E. W. Hebard, D. McVichie, F. M. Moore, and W. H. Rood were re-elected directors. The board was organized by the election of Julius Ropes, president; E. W. Hebard, vice-president; C. R. Ely, secretary; E. B. Howard, treasurer; W. N. Rood, general manager, and George Weatherstone, superintendent. The secretary's report showed resources, exclusive of mine, amounting to $116,119.02, and liabilities of $28,496.03, including the February payroll. The receipts for the year ending February 28th, 1891, including $4,659.14 on hand March 1, 1890, were $87,161.22. The expenditures were $86,602.58, leaving on hand a balance of $558.64. An assessment of 25 cents per share has recently been levied to provide a working capital for the coming year. This will yield $20,000. It is needed to properly develop the lower levels of the mine which are promising, and show a lode improving with depth. The receipts for bullion during the past year were $56,543.10; for concentrates, $8,697.66. The main shaft is down 639 feet, and is rapidly pushing to the 13th level, where good rock is expected, a short distance to the east of the shaft. At the 11th level the drift east is in 135 feet, the last 35 feet being in rock which averages $4 per ton and is improving. This rock is expected nearer the shaft in the 12th level. The total amount of drifting done during the year was 893 feet; winzes sunk, 190 feet; amount of rock mined and treated, 31,578 tons; average yield per ton, $2.45; average cost per ton for mining and treating, including cost of new machinery and buildings, $2.74—exclusive of those betterments, $2.55.

IRON.

MARQUETTE RANGE.

IRON CLIFFS MINING COMPANY.—The Barnum mine, the property of this company, closed down last week, says the *Iron Ore*. It is one of the old openings, work being first commenced there in 1868. Since that time it has produced about 815,000 tons of good-quality ore. Its lenses have been wrought to nearly their full limit, and there is little to expect in the way of a profit for future operation, certainly not at the present prices offered for ore.

(From our Special Correspondent.)

CLEVELAND IRON MINING COMPANY.— The night shift at No. 1 Lake shaft was "locked out," last Saturday night, for disobedience of orders. The miners had decided on Friday to take 15 minutes before quitting time, at the end of each shift, for reaching the surface. Superintendent Mills was notified and telephoned orders to "lock out" the night shift if work was dropped before six o'clock. Notwithstanding this the miners carried their resolution into effect, by quitting at 5:45 Saturday morning. The men claim that the climb from the mine is a hard one, and that heretofore the last man has not been able to get out before 20 minutes past 6 o'clock. They therefore demand an allowance of 15 minutes. The management claims that it has always allowed 10 minutes, and hesitated to make any concession lest it might establish a dangerous precedent. A conference was held on Monday, and the men were then informed that Superintendent Mills would yield the point until he could communicate with the headquarters of the company. The Cleveland management has for some time been considering the advisability of laying off the night shift until the ore market showed improvement, but were reluctant to throw so large a force out of employment.

SAGINAW IRON COMPANY.—The prospects at the Saginaw mine are bright. Work is being done mostly on the fifth level east, west, and north of No. 2 shaft. West of the shaft a new lens has been opened by a short drift. It appears to be as large as the main lode and is of equal quality. There is good stoping ground east of the shaft, where the hanging raises and makes off flat to the northward. The ore is very hard, running 68·16% iron, ·046% phosphorus, and 1·40% silica. Additional pumps have been ordered, and upon their arrival the unwatering of the east end of the mine will be commenced.

MENOMINEE RANGE.

It is said that important ore discoveries have recently been made on what is known as the Kelly property, controlled by John B. Weimer. A shaft has been sunk 104 feet, and is bottomed in an excellent quality of soft blue Bessemer ore assaying 62% in metallic iron and very low in phosphorus. The property is a mile square, and comprises the west half of section 34 and the east half of section 33, 40-30, adjoining the old Quinnesec mine on the west. Another find has been made by Dr. Crowell. He has sunk a drill hole 400 feet on the north line of section 3, just south of the Quinnesec mine, and has pierced 34 feet of magnetic ore.

LUMBERMEN'S MINING COMPANY.—At a meeting of this company's stockholders, held in Menominee on the 25th ult., the following officers were elected: A. A. Carpenter, president; F. A. Brown, secretary and treasurer. Superintendent Bankes retains his position as superintendent of the mine, the Ludington.

MASTODON.—At this mine the work of stoping at the 400-foot level is being pushed. Some work will be done in the open pit this spring. About 15,000 tons of ore are in stock.

PENNSYLVANIA IRON COMPANY.—The new shaft of the West Vulcan mine, says the *Norway Current*, was sunk 72½ feet in 24 days last month, and is now 500 feet deep, or half way down. The sinking for last week was 19½ feet. The drift east from the sixth level is in about 100 feet of the 162 required to connect with the crosscut from the north to the south vein.

MISSOURI.

It is reported that the final arrangements were completed recently for the organization of a stock company, with a capital of $300,000, to purchase and operate the onyx mines and caves in Pulaski and Crawford Counties. Works for the dressing and preparing of the stone will be erected in St. Louis. For several years the attention of scientists has been attracted to the wonderful deposits of onyx in Central Missouri. Many caves had been discovered, but they have never been perfectly explored. Pieces of the formations were broken off and found, when polished slightly, to present a very handsome appearance. Mr. H. E. Rood, owner of one of the largest caves in Pulaski County, has taken steps towards securing control of the caves in that vicinity. He succeeded in interesting Messrs. J. F. Leighton, Post & Delmar, James Boyd and others, of St. Louis. About a year ago a syndicate was formed for the purpose of purchasing all the desirable onyx properties in Central Missouri. An investigation proved to the members of the syndicate that onyx was found in nearly all of the caves, but only in small quantities in most of them. The main formations seemed to be in three caves and four open workings. Two of the caves and quarries are located in Crawford County and one cave and two quarries in Pulaski County. On the recommendation of experts the syndicate purchased these properties. Mr. Guy H. Reynolds, proprietor of the only onyx-polishing works of this country, whose plant is located at Rutland, Vt., went to St. Louis recently with a view to inspecting the find, and it is now reported that he has decided to move his works to that city.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, March 9.

The weather of the past week has been very unfavorable for mining operations in this district owing to the extreme cold that has interfered with the washing and cleaning of the ore. However, there has been an average sale of zinc ore, but no inclination to advance the price; the local buyers held the market price down to an average price of $23.50 per ton, while lead ruled strong at $24.50 per thousand. The following are the sales as far as reported from the different districts: Joplin mines, 2,661,030 pounds zinc ore and 143,340 lead, value $35,022; Webb City mines, 1,340,730 pounds zinc ore and 26,860 lead, value $16,411.07; Carterville mines, 910,090 pounds zinc ore and 142,460 lead, value $14,112.50; Zincite mines, 163,590 pounds zinc ore and 2,320 lead, value $2,045; Lehigh mines, 131,650 pounds zinc ore, value $1,640; Sherwood mines, 5,470 pounds zinc ore, value $64; Oronogo mines, 33,340 pounds zinc ore and 9,120 lead, value $384; Galena, Kans., mines, 986,490 pounds zinc ore and 49,870 lead, value $12,023; districts, total value, $81,701 57; Aurora, Lawrence county, mines, 210,000 pounds zinc ore, 320,000 pounds silicate and 121,000 lead, value $7,235; lead and zinc belts, total value for the week, $88,936.27.

Pittsburg and Wier City, Kansas, spelter output: R. Lanyon & Co., 178,000 pounds; S. H. Lanyon & Bro., 97,000 pounds; Granby M. & S. Co., 96,500 pounds; W. & J. Lanyon, 96,800 pounds; Wier City Zinc Company, 145,000 pounds; total, 613,300 pounds.

The Picher Lead Company has received the first carload of 1,000 tons of low grade refractory ore from Colorado, recently purchased by its agent in that district, and from an assay made by their chemist, Mr. Petreaus, it is found to contain about 30% of lead, 15% to 20% zinc, and a small amount of gold and silver. The Picher Lead Company has been making a specialty of producing pig lead and sublimed white lead by the Lewis-Bartlett process, and to-day is producing at the rate of 65,000 pounds of pig lead and 25,000 of sublimed white lead every twenty four hours. Mr. Bartlett, the inventor and patentee of the Lewis-Bartlett process, has been experimenting for some time with the low-grade refractory ores of Colorado and finds that by his process he can handle them successfully, saving the gold, silver, lead and zinc.

The Sherwood mining district, located only about 4½ miles northwest of Joplin, has been practically deserted for a number of years; in the early history of this section it was one of the noted producers of surface lead and zinc ores, but owing to the heavy flow of water at a depth of 60 to 80 feet, and the primitive manner of operating and draining the ground at that time, the mines were practically abandoned. Recently men of means have located in this deserted camp, have put in machinery capable of draining the mines to greater depth, and are now producing a good grade of zinc ore. Mr. F. S. Treadway, superintendent of the Mineral Creek Land and Mining Company, states that he has just completed arrangements for putting in a new plant of machinery, consisting of a 35 horse power engine and 55 horse power boiler on his 40 acre tract of land. The Jackville Mining Company, under the management of Superintendent Reeves, is opening up an excellent body of ore at a depth of 140 feet. The prospects are that, with proper development and adequate machinery, the Aurora district will resume its old position in the list of producing camps of Jasper County.

ST. FRANCOIS COUNTY.

(From our Special Correspondent.)

DOE RUN LEAD COMPANY.—At a meeting of the shareholders of this company, March 2d, it was unanimously voted to increase the capital stock from $500,000 to $750,000. The company is now sinking a shaft, to go down 400 feet, near Flat River, seven miles from its works. A railway line has been

located between the two places and construction work will be commenced as soon as the weather permits. The Doe Run property, which was opened about four years ago, is about 14 miles from that of the St. Joseph Lead Company.

ST. JOSEPH LEAD COMPANY.—This company is preparing to remove the smelting department of its extensive plant from the mines to a point on the Mississippi River 27 miles below St. Louis. The change is made in order to effect a saving in freight on coal and other supplies.

MONTANA.

BEAVERHEAD COUNTY.

BIG HOLE PLACER MINING COMPANY.—This company held its annual meeting recently in Helena. The old board re-elected Joshua Midgeley, President; George A. Meears, William Fuller, Del Wilson, Nathan Sears, directors; W. G. Van Horne, Secretary. The reports showed everything satisfactory, and it was stated that work would begin again in thirty days. The Duncan property, bought last summer, has proven an excellent investment.

DEER LODGE COUNTY.

HOPE MINING COMPANY.—The situation at this mine is said to be more encouraging than it has been at any time since the mill was compelled to close down. From the most recent report of Superintendent Ringeling, the vein has been struck in the face of the northeast drift from the 140-foot level, and is in ore that will run over 100 ounces in silver.

MADISON COUNTY.

WASHINGTON BAR.—The Nettletons, it is reported, will resume work on their gravel mines next month. This company owns 3,800 acres of gold-bearing gravel ground, which prospects well, and is in the vicinity of Pony. They have a good hydraulic power with 600 inches of water.

MEAGHER COUNTY.

CUMBERLAND MINING COMPANY.—A new and distinct vein is recently reported to have been encountered on the 500-foot level in the old working shaft, which gives promise of developing an additional bonanza. The new three-compartment shaft at the time of our last report had reached a depth of 135 feet. Michael Cooney, who has so ably filled the position of superintendent for several months, has tendered his resignation, private interests demanding his attention. He is succeeded by Bernard McDonald, recently of Colorado. Ground has already been broken for the company's new smelter, but the laborers struck after a few days' work for a raise from $2.50 to $3 per day. According to later advices, the strike has affected the miners and a union has been organized. The Laborers' and Miners' Union, 50 in number, formed in Castle and marched to the Cumberland mine with the avowed purpose of driving out those at work. They were met by the superintendent and his foreman. The former drew his gun and stood off quite a number of them; but the foreman was handled rather roughly. Officers soon arrived, arrested the 50 and took them to White Sulphur Springs. It is understood that the company's new machinery will be shipped from Chicago shortly.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The Moose mine is reported to have been closed down during the past month, but is now about to resume work. This is one of the silver-bearing properties and adjoins the Valdimere on the east, and is situated on the Alice and Moulton lead. It is possible that the mine will remain in its present state of inactivity until the company has greater reduction capacity. At the Harris & Lloyd mine the shaft is down to the 400-foot level, and further sinking has been suspended. The crosscut to the lead has been commenced, and it is expected that ore will be encountered shortly. The drift on the 300 continues in good ore, the stopes in the upper levels are pretty well worked out. As a matter of fact, development work has not been kept as far ahead in this mine as in some of the others of the company. The new Leonard shaft of the Colusas has just recently been connected with the old levels by a crosscut, which was run from the 500-foot level of the East Colusa through about 325 feet of country rock to the new shaft. As soon as all the arrangements are complete, this will be used as the main working opening of the mine.

BUTTE & BOSTON MINING COMPANY.—In the hope of lessening the smoke in the city, this company has started some of its roast piles on the Gray Rock Hill. This is northeast of the city and a region much frequented by sharp northwestern winds. It is thought that the smoke will thus be prevented from dropping to the lower level of Butte.

BLUE BIRD MINING COMPANY.—The litigation which caused a partial suspension of operations at this mine for nearly a year has just been settled out of court, and upon terms which permit the immediate resumption of work at the mine and mill. The settlement was effected by the Blue Bird company's purchasing of James A. Murray all his right, title, and interest in the claims immediately adjoining and surrounding the Blue Bird—*i. e.*, the Darling lode claim, the Little Darling, the Lena K., the Synfax, the Uinta, and the Nautalus lode claims. Mr. Murray received $10,000 in cash and accepted in addition two of the company's notes for $25,000, payable in 27 and 30 months from date, respectively. An agreement that both parties should withdraw their suits was signed. In one of the last clauses it was stipulated that the suits of James A. Murray against Patrick A. Largey and others for partition of portions of the ground already described shall be continued at the discretion of the Blue Bird company.

NEVADA.

ESMERALDA COUNTY.

HOLMES MINING COMPANY.—Superintendent Jackson says, in his last weekly report on this property, that the Sutherland tunnel has now reached a point 74 feet south of the Silver Star shaft. The face of the tunnel is showing a nice stratum of ore assaying 37 ounces. The stopes above this level are producing the usual amount of ore assaying 40 ounces. On the 11th level a stope has been started from the new Yankee winze below. It looks first-rate, and is producing considerable ore assaying 40 ounces. On the first intermediate level the west stope is not looking as well as at the last report; it is producing some ore, however, assaying 26 ounces. During the week ending March 3d, 205½ tons of ore, of an average battery assay of 28 ounces, were crushed.

STOREY COUNTY—COMSTOCK LODE.

COMSTOCK TUNNEL COMPANY.—This company is now paying at its office, 115 Broadway, New York, one of which fell due May 1st, 1890, and the other November 1st, 1890, two 2% coupons, the same being the amount due on its bonded indebtedness of $2,139,000. Concerning the delay in their payment, the ratification of the new contract by the mining companies, the future policy of the company and its financial status, Mr. Theo. Sutro, president of the company, made the following statement to a representative of the ENGINEERING AND MINING JOURNAL: "These coupons, which are past due and are now being paid, could not have been taken up sooner for the reason that the mining companies resisted the collection of royalties, on the pretext that a suit brought against the Comstock Tunnel Company by a few of the stockholders of the old Tunnel Company made it uncertain to which company the royalties should be paid. The true reason, however, was that the companies wanted a reduction in royalties. Negotiations for the settlement of the royalty matter have been carried on with the mining companies for over a year. It resulted in a preliminary agreement, which was reached on November 1st, 1890. Since then continued negotiations have taken place in reference to the details of the agreement. The contracts were finally agreed upon and executed last week. The sum of $225,000 cash was paid over to the Tunnel Company by the mining companies on account of royalties due and remaining unpaid to November 1st, 1890, under the old contracts, leaving a balance of about $18,000, which is expected within a short time. All the mining companies are about to pay the royalties due since November 1st, 1890, under the new contracts; the Consolidated California & Virginia having already paid about $10,000 of its share. These figures are subject to correction, as sworn statements have not yet been secured. They are also subject to expenses of litigation and collection. However, they are approximately correct. *Quasi* test suits pending against the Crown Point and Yellow Jacket mining companies, to compel the payment of royalties, will be discontinued.

"The amount absorbed by the two interest coupons is $85,560. After payment of this amount there will remain in the treasury of the company about $215,000. This includes a balance of $23,000 carried over from last year, and the estimated amount of royalty due from the mining companies under new contracts to March 1st, 1891. Under the terms of the mortgage there will be about $90,000 representing surplus net earnings available for redeption of bonds, which will be paid out as soon as the accounts can be properly adjusted.

"The new contracts have been issued between the following mining companies and the Tunnel Company: Alpha, Belcher, Best & Belcher, Bullion, Chollar, Confidence, Crown Point, Consolidated Imperial, Challenge, Exchequer, Hale & Norcross, Gould & Curry, Kentuck, Overman, Ophir, Mexican, Potosi, Sierra Nevada, Savage, Union Consolidated, Utah and Yellow Jacket.

"There remains one company, the segregated Belcher & Midas, with which execution of contract has been delayed on account of some technicality. The Comstock Tunnel Company also claims royalty from the Alta, Justice and Occidental mining companies, under an act of Congress of July 25th, 1866. We claim that the tunnel is a benefit to these properties, being a medium of drainage, and in consideration of the fact that the majority of the companies have ratified the contract providing for the payment of royalty, these last-named corporations should also pay a royalty. Steps will be taken at an early date to test the question in the courts."

The points wherein the new contracts differ from the old have already been set forth in the ENGINEERING AND MINING JOURNAL.

Concerning the history of the Comstock Tunnel Company, the following brief summary in this connection is pertinent: "It was incorporated under the laws of New York, August 31st, 1889. The capital stock is 2,000,000 shares of a par value of $2. The stock is non-assessable. There is an authorized bond issue of $3,000,000, and of this amount $2,139,000 face value have been issued, bearing 4% interest, payable semi-annually out of the net income. The remaining $861,000 in bonds is in the treasury, and may be issued at any time by the unanimous consent of the stockholders; the proceeds to be used only for extensions and improvements."

Concerning the litigation now pending, Mr. Sutro said that "a few of the old stockholders claim that the bonds which were subscribed for by shareholders of the old company assenting to the plan of reorganization were in equity the bonds of the old company, and that the money resulting from their subscriptions belonged to the old company, and that whatever rights were acquired by the use of this money should accrue to it.

"The Comstock Tunnel Company, in answer, claims that these same stockholders subscribed for these same bonds and assented to the plan of reorganization, the sale of the property under foreclosure and the formation of the company.

"The suit is pending in the U. S. Circuit Court, district of Nevada.

"The plaintiffs have closed their testimony in chief, and the Tunnel Company has almost closed the answering testimony. The complainants still have an opportunity to take testimony in reply. The case cannot be put on the calendar until next fall. A decision is not likely for a year to come.

"The company has in contemplation the execution of some important new work on its property, at an early day, in the way of running drifts along some of the veins cut by the tunnel. Among the more important lodes which will be explored is the Brunswick."

(From our Special Correspondent.)

SAN FRANCISCO, March 5.

The following Comstock Mining Companies have paid off their indebtedness to the Comstock Tunnel Company under the terms of the recent contract:—Consolidated California and Virginia, $137,000; Hale and Norcross, $38,810; Crown Point, $32,719; Overman, $8,015; Belcher, $4,715; Confidence, $1,040; Challenge Consolidated, $876; and Consolidated Imperial, $796. The Chollar and Savage companies will settle their accounts within the next few days. The Gould and Curry Mining Company has a credit of $39,814.12 with the Tunnel Company, that being the balance of what the Gould and Curry company paid for extending the north lateral branch of the Sutro tunnel through its ground. By the terms of an agreement with the Tunnel Company, the Gould and Curry, should the mine again become productive, would have to pay only one half of the regular royalty rate on ore. The remaining half would be deducted from the sum which is charged against the tunnel company.

During the past week the following amounts of Comstock ore was milled:

	Tons.	Assay value.
Con. Cal. & Virginia.....	1,555	$28.25
Choilar.....	419	18.50
Justice.....	202	15.66
Overman.....	406	17.60
Savage.....	540	15.60

CROWN POINT MINING COMPANY.—The surface of the water in the incline was, on Saturday last, 37 feet (vertically) below the floor of the 1,600-foot level station, the water having been lowered nine feet during the week. Operations were stopped on Thursday on account of the shaft being caved at the bottom, but repairs are completed and pumping is again in progress.

POTOSI SILVER MINING COMPANY.—A station is being excavated at the 1,300-foot level of the winze, and lateral drifts north and south will soon be started, preparatory to crosscutting on that level.

NEW MEXICO.

DONA ANA COUNTY.

A stratum of coal is reported to have been found in the Doña Aña Mountains, a few miles from Las Cruces. This is said to be the first coal discovered in that locality, and the find is of great importance, as, if it proves to be as represented, it will insure the resumption of the smelting plant of that place, which has long lain idle on account of the exorbitant cost of fuel. The Organ Mountains could furnish a sufficient quantity of desirable lead carbonates and other fluxes. For years it has been known that coal existed in that vicinity, as pieces of coal which had been washed down from some point north had frequently been found. The vein just discovered crosses the Rio Grande near Fort Selden. Work will be vigorously prosecuted and the vein further developed.

GRANT COUNTY.

VIOLA.—According to report a good strike has recently been made on the 100-foot level, in the lateral drift, midway between the stopes and the crosscut. This mine has been working steadily. The stopes average about eight feet in width and contain considerable mineral.

LINCOLN COUNTY.

OLD ABE.—Work at this mine is progressing satisfactorily. The ten-stamp mill has been kept busy throughout the winter, and has been treating about ten tons a day with, it is said, most encouraging results.

SANTA FE COUNTY.

SANTA FE COPPER COMPANY.—Upon inquiry at the office of this company, at Messrs. Lewisohn Bros., an ENGINEERING AND MINING JOURNAL reporter learned that the furnaces at the mine have been in operation a little more than a week. The concentrator is handling about 75 tons of ore per day and is said to be doing good work. The pumps have all been set up. Within a short space of time the Santa Fe will again be classed among the copper producers.

NORTH CAROLINA.

(From our Special Correspondent.)

The North Carolina Legislature has appropriated $10,000 for the State Geological Survey, and Prof. J. A. Holmes, of the State University, has been appointed Geologist in charge. It is understood that the United States Geological Survey will work in connection with the above and make a topographical survey of the State.

PENNSYLVANIA.

The chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States, for the month of February, 1891, and during the eight months ending February 28, 1891, as compared with similar exports during the corresponding periods of the preceding year, as follows: February, 1891, $3,159,025; February, 1890, $3,139,448; eight months ending February 25, 1891, $36,483,516; eight months ending February 28, 1890, $35,435,411.

COAL.

The nine-weeks strike of the miners of the Monongahela Valley has been ended. The settlement was brought about at a meeting of the coal operators on the 6th inst., at which they agreed to pay the 3½-cent rate, thereby granting the advance of ½ cent per bushel which has been asked. The chief cause which led to the concession was the demand of operators in the New Orleans trade, who found it was absolutely necessary to have coal. It was a case of keeping contracts or paying claims for nonfulfillment of them. The miners resumed work under the new scale on Monday. The pool boats will be kept busy night and day. There are now at the harbor 1,500 empty coal boats and barges, which will be loaded and shipped as fast as possible. Last year the shipment of coal from Pittsburg amounted to over 125,000,000 bushels. According to an operator, 30,000,000 bushels were prevented from being shipped by the nine-weeks idleness. The miners will receive higher pay, it is said, than they have had the last ten years or so.

J. C. HAYDEN & CO.'S NO. 1 SLOPE MINE.—The coroner's jury in the case of the mine disaster at Jeanesville on February 4th, when 18 miners were caught by a rush of water through the portion of the mine in which they were working, returned a verdict on the 7th inst. in which it says: "We find from the evidence that said accident occurred by reason of an incorrect map of said mines made at some time in the history of the old workings of No. 8, which showed the gangway of the old workings to be about 50 feet shorter than it actually was, and an apparent discrepancy in the location of No. 11 breast of No. 10 gangway of 40 feet, making an error of 90 feet in the map, thereby permitting breast No. 11 to be driven directly toward the water; whereas the map showed that the driving up of breast No. 11 would leave 40 feet of a pillar between it and the old workings, namely, No. 8 gangway."

OIL.

There is said to be great excitement at Elizabeth on the Monongahela River over the discovery of petroleum; it is reported that the first well bored gives 200 barrels a day.

SOUTH CAROLINA.

(From our Special Correspondent.)

The phosphate market is very unsettled by the action of the State phosphate commission. It seems there has been some irregularity in the method of reporting the phosphate rock by the different companies. The latter are greatly annoyed because they are required to return the rock at market value. They claim, that the cost of mining and other expenses connected therewith, should be deducted from the price at which the rock is sold. Some of the companies return their rock at $1 per ton, some at $2, and some at $2.95.

The Coosaw Company has had considerable trouble with the State authorities. Inspector Jones was empowered by the Governor to dredge in that company's territory, and upon his attempting to do so, the latter filed a protest, and there the matter rests. The company intends to refrain from dredging rock, and to prevent others from doing so until the courts decide the matter. On the 6th inst. Judge Simonton, of the United States Court, granted a temporary injunction by which the State Phosphate Commission is enjoined from entering upon or in any manner, directly or indirectly, interfering with that part of the Coosaw River heretofore occupied by the Coosaw Mining Company. The injunction was granted under the act of 1876, and also applies to the Carolina Mining Company, which seems to be the name of the anti-Coosaw mining combination which had obtained licenses to mine from the phosphate commissioners. The complainants have given a bond of $25,000 to secure the defendants against damages, in case the injunction is dismissed, and the latter can, by giving eight days' notice, move to dissolve the injunction. This will effectually stop the mining of phosphates in the Coosaw territory until the case is finally settled.

Section 202 of the General Statutes provides that, "The gross proceeds only, of such mines and mining companies shall be assessed for taxation, and if the companies, refuse to return the gross proceeds the auditor must ascertain what the gross proceeds, are, and if the facts cannot be ascertained in any other way, the auditor must follow sections Nos. 239, 240 and 241 of the General Statutes, which authorize him to receive sworn statements from any persons as to the truth of the matter connected with the returns."

The outcome of this suit will be watched with a great deal of interest. It is thought by some, that the present condition of affairs will put an end to all contracts abroad for phosphate rock.

SOUTH DAKOTA.

LAWRENCE COUNTY.

GOLDEN REWARD CHLORINATION WORKS.—The clean-up for the first half of February, according to local papers, is said to have resulted in a brick valued at $8,500, which was forwarded to New York by Wells-Fargo's express. For the last half of this month, and thereafter semi-monthly, the amount of gold saved will probably be much larger, as by that time the capacity of the plant will have been increased 20 tons per day. The new barrel, which was ordered some time ago, left Chicago on the 24th ult. and, unless delayed by unforeseen circumstances, has now probably reached Deadwood. Everything is ready for it and little or no delay will be had in setting it up and placing it in operation. It is a mammoth piece of machinery weighing 17,000 pounds. Another barrel has been ordered and will reach the works early in April. This will further increase the capacity 20 tons and enable the plant to handle not less than 60 tons per day. The monthly output, basing estimate on what is at present produced with a daily capacity of 20 tons, should then be rather over than under $50,000.

RICHMOND.—It is reported that this company is at present employing 70 men, the majority of whom are under ground breaking ore and pushing developments. Five stamps of the mill are dropping, and the ore is then put through the Brückner roaster, which has lately been substituted for the White & Howell roaster. Chlorination saves about 93%, and Superintendent Havens is reported as so well satisfied with the Brückner roaster that he is about to put up another. When this is placed, the 15 stamps now idle will begin to drop, increasing the capacity of the mill from nine to thirty-six tons.

UTAH.

EMERY COUNTY.

GILSON ASPHALTUM COMPANY.—This company is shipping a carload of gilsonite to St. Louis daily, and it is probable that this amount will be increased to three or four cars per day during the next two weeks.

JUAB COUNTY.

BULLION-BECK AND CHAMPION MINING COMPANY.—Valentine L. Thomas and S. W. Pullian have brought suit against this company in the Third District Court. This is an action in which plaintiffs make complaint that the Bullion-Beck and Champion Company have drifted from the Emma, which is a part of the mining property owned by the defendants, and have gone into the Alma mining claim, owned by plaintiffs, and extracted ore therefrom. They also set up the claim that the lode from which this ore was taken has its apex within the lines of the Alamo claim. Plaintiffs place the amount of ore extracted by defendants at 1,000 tons, of the value of $100 per ton, and ask for judgment in the sum of $100,000. About 260 men are at present employed at the mine, to whom from $22,000 to $23,000 per month is disbursed. The company has now sunk its shaft to a depth of 700 feet, the last 100 having gone down since December. The station has been cut out, and a drift is being run south to tap the ore body, which is supposed to be about 100 feet from the shaft. Its location is pretty well known from developments in adjoining mines. The company is stoping ore on the several levels from the 200 to 600 foot levels inclusive. The company has just sold 1,000 tons of ore to the Philadelphia Smelting and Refining Company, of Pueblo, Colo., and has contracted to supply the Denver works of the Omaha & Grant Smelting and Refining Company with 1,000 tons monthly. This is only about one-third of the output that the Bullion-Beck and Champion Mining Company expects to make this year. At the annual meeting of the company on the 2d inst. the following officers were elected: Moses Thatcher, president; John Beck, vice-president; W. B. Preston, treasurer; W. J. Beatie, secretary; Moses Thatcher, John Beck, William B. Preston, A. E. Hyde and George Q. Cannon, directors. A. E. Hyde is retained as general manager and W. H. Smith, mine superintendent.

WASHINGTON.

SPOKANE COUNTY.

THE NORTHERN PACIFIC REDUCTION COMPANY.—This company was formed by Henry B. Clifford, and is composed largely of Eastern capitalists, Colonel Robert G. Ingersoll being president. F. W. Burbridge is secretary of the organization and manager of the works. The ore capacity of the smelter, inclusive of the fluxes, is between 150 and 200 tons per day. At the start about 65 men will be employed, and this number will, most probably, be largely increased in a short while. It is estimated the expenses will be about $175,000 per month. For labor, $15,000; for fluxes and incidentals, $10,000; for fuel, $15,000, and the remaining $135,000 will be used in the purchasing of ore. It is said, that the recent discovery of iron ore and other valuable fluxes near Spokane makes success for this important industrial enterprise almost assured. The continued opening up of new mining countries by new diverging lines of railroad, and the constantly increasing wealth of mines already developed, will only add to this assurance. The smelting works are located about four miles from the business center of the city, near the Spokane River and in easy access to three diverging lines of railroad. The site is an excellent one, as the lay of the land affords splendid opportunity for planning the works in such a manner, that the course of the ore from the time it is received untilit is drawn from the furnace as bullion, is alwaysdownward.

WYOMING.

ALBANY COUNTY.

(From our Special Correspondent.)

LARIMIE, March 6.

KEYSTONE MINING COMPANY.—Lionel Sartoris, one of the owners of this company, is now in London endeavoring to secure funds to prosecute deeper work in the Keystone and Florence mines. The Keystone is now idle, but the Florence is being steadily operated, and is producing more ore than ever before. The mill is running regularly and with good results.

CARBON COUNTY.

(From our Special Correspondent.)

LARIMIE, March 6.

The name of the new mining camp in this county, discovered last autumn, formerly known as Brush Creek, has been changed to Gold Hill. Four roads are being built thither, and are now nearly completed. One runs from Rawlins via Saratoga, one from Larimie, one from Rock Creek, and one from Carbon. Considerable work has been done in the camp during the winter. The deepest shaft is that on the Leviathan claim which is down 65 ft., and shows a vein 14 ft. between walls. The vein matter prospects well in the pan. There are many holes from 10 to 40 ft. in depth, and the general indications are that this will be a promising gold district.

FOREIGN MINING NEWS.

GREAT BRITAIN.

SALT MINES SYNDICATE.—This corporation has been registered in Scotland, with a capital of £8,000, divided into 25 shares of £100, with a preference dividend of 8%, and 55 ordinary shares of £100. Its object—to purchase and work the mining and other rights and leases, held by Dundas Simpson, on lands near Carrickfergus, Antrim.

MEXICO.

STATE OF CHIHUAHUA.

SABINAL MINING AND SMELTING COMPANY.—This company has recently purchased a large group of mines in the Sabinal district, and, under the superintendence of Dr. J. McLeish, intends developing the property. The first shaft was sunk on the Perrisema claim on a contact of granite and porphyry 4 feet in width. A tunnel has also been started on the vein with the intention of intersecting the shaft. The first lots of ore from this prospect were sent to the El Paso Smelting Works, and, according to report, gave smelter returns of 521 3-10 ounces silver per ton for first-class ore and 211 9-10 ounces for second-class. On the Tesoro Grande mine of the same group a 4-foot vein of galena ore has been struck at the bottom of a 60-foot shaft. The ore carries 60 to 200 ounces of silver and 40% lead. Work on both mines will be pushed with all possible speed, and other claims developed as rapidly It is reported also that the company intends building a smelter of sufficient capacity to reduce to bullion the entire output of this district.

MEETINGS.

Adams Electric Company, at the office of the company, No. 314 North Seventh street, St. Louis, Mo., March 23d, at 10 A. M.

Arcadia Coal Company, Limited, at the office of the company, No. 1 Broadway, New York City, March 25, at 12 o'clock, noon.

Clay County Mining and Milling Company, at office of the company, Room 7, News Block, Denver, Colo., April 15th, at 10 A. M.

May-Mazeppa Consolidated Mining and Milling Company, at the office of the company, Room 7, News Block, Denver, Colo., April 2d, at 10 A. M.

Phenique Chemical Company, at the office of the company, No. 2,715 Cass avenue, St. Louis, Mo., March 16, at 9 A. M.

DIVIDENDS.

Aspen Mining and Smelting Company, dividend No., 22 of 10 cents per share, $10,000, payable

March 14th at the office of the company, No. 54 Wall street, New York City.

Clay County Mining and Milling Company, dividend of two per cent., $4.000, payable March 23d, at the office of the company, Room 7, Patterson & Thomas Block, Denver, Colo. Transfer books close March 16th and reopen March 24th.

Comstock Tunnel Company, the interest coupons, Nos. 1 and 2 of the first mortgage income bonds of this company, will be paid on presentation at the office of the company, No. 115 Broadway, New York City.

May-Mazeppa Consolidated Mining and Milling Company, dividend No. 10 of 1¼%, $12,500, payable March 14th at the office of the company, Room 7, New Block, Denver, Colo.

Minnesota Iron Company, dividend of 1½ per cent., payable April 1st, at the office of the company, Mills Building, 15 Broad street, New York City.

The directors of the Lehigh Valley Railroad Company have declared a quarterly dividend of 1¼%, payable March 15th.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Amn't per share.
Alliance, Utah.....	12	Feb. 24	Mar. 31	Apr. 20	·10
Atlantic, Con. Nev..	7	Nov. 19	Mar. 2	Mar. 21	·25
Belcher, Nev	41	Feb. 17	Mar. 24	Apr. 13	·50
Best & Belcher, Nev.....	48	Feb. 17	Mar. 25	Apr. 15	·25
Challenge, Nev.....	8	Jan 26	Feb. 27	Mar. 18	·50
Confidence, Nev.....	18	Feb. 12	Mar. 16	Apr. 9	·75
Con. St. Gothard, Cal	2	Feb. 12	Mar. 31	Apr. 20	·15
Crocker.....	16	Feb. 16	Mar. 20	Apr. 13	·10
Crown Point, Nev	54	Feb. 19	Mar. 26	Apr. 16	.50
Gould & Curry, Nev.....	66	Feb. 3	Mar. 11	Apr. 7	30
Head Center.....	2	Jan. 19	Feb. 19	Mar. 25	·05
Idlewild, Cal	1	Jan. 29	Mar. 2	Mar 21	.10
Martin White, Cal..	25	Feb. 2	Mar. 6	Mar. 30	·50
Midas, Cal	1	Jan. 13	Feb. 23	Mar. 23	·20
Savage, Nev.....	7	Feb. 13	Mar. 18	Apr. 7	·50
Silver King, Ariz ...	5	Feb. 21	Mar. 30	Apr. 28	.20
Wood River, Id. ...	1	Jan. 31	Mar. 9	Apr. 6	·00¼

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, Salt Lake City, San Francisco, Baltimore, Denver, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 341 and 343.

NEW YORK, Friday Evening, March 13.

The week under review in the New York mining stock market has been of a nature to surprise even the most sanguine of bulls. A marked improvement has taken place along almost all lines in the market. The total number of shares sold were greater than they have been for six months past. This fact, combined with a very wide inquiry, stiff offers and a general rise in values, notably that of the Comstocks, has been sufficient to bring cheer to the somewhat despondent brokers and many long-suffering shareholders. It is not difficult to find the cause. The movement which was started in Comstocks three weeks ago on the San Francisco Exchange has gradually developed until to-day it has reached a point which would seem to indicate that there is something substantial back of it. The New York Exchange, of course, kept pace with that of San Francisco, and the steady ascent of the Comstocks has carried other stocks with it. The upward movement of these latter stocks, which, however, is by no means gigantic, has been given additional impetus, it is believed, by a more settled public belief as to a stable financial policy.

In the list of stocks which are quoted to-day will be found half a dozen which have not been on the board for many weeks. The following dispatch from San Francisco, filed after the closing of that Exchange last night, will be pertinent in this connection, as it speaks well for the future of the local market. "To-day witnessed the largest transactions in mining stocks since the big Consolidated California and Virginia 'boom' five years ago. The same stock was the favorite to-day as then. Three months ago Consolidated Virginia could be bought for $2.65 a share, and nobody except insiders wanted it. Then it advanced at a jump to $5, and scores of shorts had to fill at that figure. For the last four weeks it has been run up and down between $9 and $7, but to-day it spurted to $12.50, dropping back at the close to $11.50. Young 'Jim' Flood's broker bought in over 6,000 shares, yesterday and to-day. Some say the sudden rise is due to the rich ore; others that it is simply to catch shorts. Whatever the cause, it has made the stock market lively, and has advanced the prices of most stocks from a half dollar to $2."

The sales for the week aggregated 103,542 shares, as against 47,280 shares of the week previous. Of this number 13,242 shares were of dividend paying stocks. The sales for the corresponding week of last year amounted to 143,240 shares.

Of last week's transactions on the New York Stock Exchange the following are noted: Colorado Coal and Iron, 1,450 shares at $34½@$36¼; Columbus & Hocking Coal and Iron, 250 shares at $16¼; Ontario Silver Mining, 85 shares at $40@$40¼; Quicksilver Mining, 400 shares at $5⅝.

Among the securities sold at auction in the Real Estate Exchange on the 11th inst. the following mining shares are noted: Union Mining Company, of Maryland, 55 shares at $85; Consolidated Coal Company, 50 at $25.25; Quicksilver Mining Company, preferred, 300 shares at $38; Pennsylvania Coal Company, 51 shares at $281.50@$285. At the Liberty street Exchange 500 shares of International Smelting Company, of El Paso, Texas, sold for $6¼.

Of the Comstocks, as already has been stated, California Consolidated & Virginia has had the most active weekly career. This is the stock which sold at $2.50 on January 10th, and has ranged between that figure and $5 up to three weeks ago. It closed last week at $6. It was quoted on Monday at $6 63. On favorable news from the San Francisco Exchange it rapidly rose during the period under review, touching $11 to-day. The sales aggregated 2,535 shares. Those interested in the stock claim the advance is due solely to the improved condition of the mines, and that manipulation plays no part in this rise. Comstock Tunnel opened the week at 16c., making a steady climb to and closing at 22c. to-day. The payment of the 4 per cent. coupons on the bonds issued by this company, to which reference is made in another column of this issue, is doubtless responsible for the increased value; 39,000 shares changed hands. Comstock Bonds have been selling this week with 4% coupon on. The closing price to-day was 40%. Sales amounted to 15,000. This is 1% higher than was reached last week. Gould & Curry is to be credited with a remarkable rise on light sales. It opened the week on Monday at $2.30, a gain of 25c. The last sales were on Wednesday at $2.55; 2,300 shares changed hands. Hale & Norcross entered the market to-day, selling 200 shares at $2 55. This stock was last quoted on February 26th at $2.20. Ophir, not to be outdone by its companions, opened at $4.60, a gain of 80c. It rapidly fell from this figure, however, reaching $4.10, but regained and closed at $4.50. Its sales were very light. Savage reached $2.15 on Tuesday, its closing price being $2.05, a gain of 5c.; sales amounted to 560 shares. Yellow Jacket on sales of 150 shares reached $2.50 on Tuesday, as against $2.10 of last week. Alta opened the week at 75c., rising to and closing at 90c. to-day on sales of 900 shares. Best & Belcher fell off 5c. to $2.15. The sales were light. Chollar opened at $2, rising on Wednesday at one jump to $2.50; sales aggregated only 200 shares. Mexican made a slight advance over previous quotations. Its last quotation was Tuesday at $2.75, as against $2.65 of the previous week. Occidental opened at 80c. and, on moderately active sales, closed its weekly career at $1.15. Potosi dropped off $1 from last week's closing, opening at $3.75, but rapidly regained lost ground, and on Wednesday touched $5 50; sales amounted to 200 shares. Union Consolidated on Monday sold at $2.50, on Thursday at $3, a gain for the week of 14c. Utah, on sales of 1,100 shares, closed the week at $1, a gain of 20c. Sutro Tunnel, which has been out of the market since December 1st. 1890, at which time it was quoted at 9c., sold 2,000 shares on Saturday at 10c.

The Colorado stocks made quite a showing. Chrysolite on sales of 200 maintained its last week's price at 20c. Colorado Central Consolidated, sold 100 shares on Friday at $1.25. Bassick appeared in the market to day for the first time in several months; 100 shares sold at 7c. Freeland maintained its last week's quotation at 16c. on light sales. Iron Silver sold 100 shares at $1.20. Leadville Consolidated, on sales of 4,100 shares, maintained its price of 11c. to 12c. The former was the closing figure on Thursday. Little Chief, on one sale of 500 shares, gained 2c., being quoted at 34c. Robinson Consolidated touched 35c. on Thursday, as compared with 30c. in the previous week. The sales aggregated 1,000 shares.

The California stocks were fairly well represented. Standard appeared in the market for the first time since February 7, at which time it was quoted at $1.45, selling 200 shares at $1.25.

Astoria received the quotation of 3c. on Thursday, on sales of 200 shares. This is about the average of its last week's price. Belmont developed considerable strength on an active career of small sales. The highest price reached was 39c. to-day, as compared with 35c. of last week; 1,500 shares changed hands.

Middle Bar reached 5c. on Thursday, closing at 4c. to-day; sales, 7,400 shares.

Brunswick fell from its forced quotation of the previous week. It opened at 13c., a loss of 3c., rapidly declining to 9c. on Wednesday. The closing price to-day was 12c.; 14,400 shares changed hands.

Col. & Beaver sold 100 shares at 3c. Holyoke was quoted on Wednesday at 6c. Its last previous sale was on February 10th at 3c.

Phœnix of Arizona lead a moderately active career at slightly decreased values. It opened the week at 40c., closing on Thursday at 36c. The sales amounted to 3,800 shares.

Silver King received the quotation of 10c. last week. On Monday 100 shares sold at 05.

Of the Utah stocks, Horn Silver maintains its customary strength, prices ranging from $3.15@$3.30, the latter being the closing price; 587 shares were exchanged. Ontario sold 10 shares at $48. This is the first time that this stock has been quoted on the Consolidated Exchange since December 20th. Transactions on the New York Stock Exchange are of weekly occurrence.

Of the remaining stocks which were traded in during the week we note transactions in Alice, of Montana, amounting to 1,000 shares, at from $1.40 to $1.35, as compared with $1.50 of last week.

El Cristo sold 200 shares at 50c. and 40c.

Mutual Smelting and Mining Company maintained its usual quotation of $1.40@$1.45 on sales of 1,000 shares.

San Sabastian, which was quoted last on January 10th at 10c., sold 200 shares at 10c.

The copper stocks were completely neglected.

Boston. March 12.

(From our Special Correspondent.)

The market the past week has presented but few features of interest. The weakness of ingot copper has not unfavorably affected the market for stocks, and we are inclined to think that the decline has been fully discounted. At all events, the dividend-paying mines continue to rule firm, and in some instances an advance is noted. There is but little doing in them, and it would seem as if investors were content to keep their holdings rather than part with them at present prices.

Boston & Montana has been the most active stock on the list and declined at one time to $40, but quickly recovered and sold up to $42¼, with later sales at $41¾. The outlook for placing the contemplated issue of bonds is considered favorable.

Calumet & Hecla hold very steady at $260, although a few shares changed hands at $258, followed by sales at $260½@$260.

Quincy is strong and in good demand, selling at $100, with more activity than usual in this stock, the sales amounting to more than 500 shares. It is expected that the sale of the Pewabic property to this company will be confirmed and possession given within a very short time. This will make a very valuable addition to the Quincy, and give the mine a long lease of life.

Osceola holds firm at $37½@$38. The action of the directors in declaring only $1 dividend is considered conservative, and strengthens the stock with the investment public.

Tamarack is quiet but steady at $145@$150, with small sales.

Butte & Boston has been a little heavy this week, selling off at $15. The reports from the mine are good, and there is no special reason for the decline.

Atlantic is dull at $15½, and Franklin is neglected; small sales only are made at $17.

Kearsarge sold at $13½ and declined to $12⅞.

Centennial dropped from $17½ to $16. We hear nothing regarding these two mines which accounts for the decline other than the general dullness of the market.

Allouez sold at $3, but the market is rather limited.

Santa Fe sold in a small way at 57½c.@60c. The latest news from the mine is "that the daily output is 25 tons first-class ore," and that the company has once more become a producer of copper.

A sale of 500 shares of Ridge at 55c. is reported. [The report of the company may be found in the column of general mining news.]

Bonanza declined to 50c. on a single sale of 100 shares.

Silver stocks continue dull and inactive. Sales of Catalpa at 25c. and Dunkin at 60c. comprise the list.

3 P. M.—Since the noon hour the market has inclined to weakness. Boston & Montana has declined to $41¼, regular, and $41, seller $30. Kearsarge sold at $13; Osceola, $37¼, regular, and $37, seller $30. Quincy was steady at $100. It is stated that Mr. Alfred Marcus and his associates have filed a petition in the court at Grand Rapids, Mich., asking to have the Pewabic sale reopened, and with the petition make an offer of $800,000 for the property. Messrs. Mason & Smith have been ordered to show cause why petition should not be granted.

By Telegraph.—Butte and Boston, $13⅞, and ½ of 1% bid to call 500 shares at 20, until July 1; Kearsage, $12½; Centennial, $16; Atlantic, $15; Osceola, $37⅝.

San Francisco. March 5.

(From our Special Correspondent.)

The market has been for the most part dull and uninteresting during the past week. Trading has been moderately active though irregular, and the only feature calculated to attract attention has been the fluctuations of the bonanza stocks. A couple of weeks ago the small traders were short on the market, and when Consolidated California and Virginia rose to $6.75 they took the chance offered to cover their contracts, and since then appear to have changed their tactics and have loaded up on the "long" side of the market. Albeit that there was another increase in the battery assays of Consolidated California and Virginia for this week prices have fluctuated considerably, and $6.62½, on Tuesday, has been the highest point touched, while considerable sales have been made at $6.00.

Overman a week ago sold for $1.85, and is selling to-day for $2.10. This company is really the only one just at present making anything over

operating expenses, and for that reason has sold stronger than most of the other Gold Hill stocks. The general tendency of the Comstocks has been downward, and although the losses have been inconsiderable, ranging from 5 to 10 cents per share, it is simply the old story again and again repeated, that in the absence of strong hands the market falls into a state of stagnation.

The outside stocks have been left for the most part severely alone. It is a rather curious fact that in the Quijotoa group, Peer, now quoted at 10 cents; Peerless, at 10 cents, and Weldon, at 5 cents, are each selling at lower figures than the assessments of last year.

Two assessments were levied by Nevada companies during the week—one of 25 cents per share on Lady Washington and one of 15 cents on Nevada Queen.

Denver.

Prices and sales for the week ending March 7, 1891:

Company. Mines.	Opening.	H.	L.	Closing.	Sales
Alleghany	23a	15	15	....	100
Amity	2¼b	*02½	02¼	02¼	1,900
Bangkok-C.-B.	07¾b	*08	07	06¾	13,200
Bates Hunter	58b	60	60	60	100
Brownlow	05¼	05¼	04½	04½	1,600
Calliope	19b	18½	16	17½	1,200
Cash	11b	....	....	....	.....
Clay County	78b	*85	79	80	6,000
Leavenworth	18b	....	....	17	.....
Little Rule	100b	*103	*103	*103	300
Matchless	275b	....	....	275	.....
May-Mazeppa	120b	125	121	122	600
Oro	100b	....	....	100	.....
Pay Rock	03b	03¼	03	03	4,500
Puzzler	03½b	04¾	04½	04	1,100
Reed National	69a	....	....	....	.....
Running Lode	17¾b	18	17½	17	300
Whale	....	....	....	....	.....
Bal Smuggler	100b	105	‡100	100	1,000
Prospects.					
Argonaut	20a	....	....	13	.....
Big Indian	*08b	*10	*10	....	100
Big Six	07¾	08¼	07¼	08¼	26,100
Century	33b	32	20	22	1,700
Claudia J.	05½b	*06	05	05½	20,500
Nat. G. & Oil Co.	08¼b	08½	08½	08½	1,000
Diamond B	02b	03½	02¼	03	13,100
Emmons	43b	‡48	43	43¼	19,900
Golden Treas	34b	34	31	31½	400
Ironclad	03	*03½	03	03¼	3,100
John Jay	06½	*07	03¾	04	12,800
Justice	12b	12¾	12½	12½	500
Legal Tender	03b	04	03¾	04	2,200
Morning Glim	45b	45	45	45	700
Park Consolidated	18¼b	....	....	19	.....
Potosi	11b	*12	11	11	3,500
Rialto	75b	80	79	80	2,700
Total					140,500

* Buyer 30. ‡ Seller 60. a Asked. b Bid.

Salt Lake City.

PRICES AND SALES FOR THE WEEK ENDING MARCH 7, 1891.

Name and Location of Company.	Highest.	Lowest.	Sales.
Alice, Mont	1.65	1.50	.....
Alliance, Utah	2.50	2.50	2,000
Anchor, Utah	6.65	6.50	.....
Apex, Utah	.14	.11	13,000
Barnes St.Ibur, Utah	.02	.01½	8,500
Big Hole Placer, Mont	.13	.10	.....
Centen'l Eureka, Utah	.....	.....	.....
Congo, Utah	.12	.07	14,500
Crescent, Utah	.29	.24	4,979
Daly, Utah	18.50	18.00	.....
Glencoe, Utah	.....	.....	.....
Horn Silver, Utah	3.17½	3.10	300
Malad Con., Idaho	.02	.01¼	9,000
Mammoth, Utah	4.30	4.15	550
Northern Spy, Utah	1.75	1.50	.....
Ontario, Utah	42.00	42.00	.....
Stanley, Utah	.19	.12	21,500
Utah L. & C. Co.	.....	.....	.....
Utah Oil Co., Utah	.02	.01½	6,000
Woodside, Utah	.....	.....	.....
Total sales			84,529

Lake Superior Iron Stocks.

(Special Report by A. M. Helmer, Milwaukee, Wis.)

IRON STOCKS.			
Ashland	$59.00	Vermillion P. & I. Co	$2.25
Aurora	9.75	Jackson	110.00
Anvil	2.75	Lake Superior	70.00
Brotherton	2.75	Milwaukee Iron Co.	5.00
Germania	9.75	East New York	1.75
Gogebic Iron Syndicate	40	Pittsburg & Lake Angeline	150.00
Ironton Bessemer Consol. Bonds	20%	Republic	28.50
Iron Belt	2.25	Chandler	38.50
Montreal	11.75	Chicago & Minnesota Ore Co.	115.00
Metropolitan	66.00	Minnesota Iron Co.	75.00
Northern Chief	35.00	MISCELLANEOUS:	
Odanah	14.50	Ropes Gold and Silver Mining Co.	1.25
Pence	1.75	Michigan Gold Mining Co.	45
Pence & Snider	60.00	Badger Silver Mining Co.	4.60
Clingstone	25.00		
Ryan	30.00		
Sec. 33	19.50		
Champion	78.50		
Cleveland	18.50		

St. Louis. March 11.

(From our Special Correspondent.)

The mining market this week was only fair and the business carried on but moderate. Some interest has been taken in Granite Mountain and in the decline in Breen and Elizabeth, but these form the exceptions to a dull week.

Granite Mountain opened at $26 and closes at $25 On Thursday 13 shares sold at $27.50 and later 10 shares at $27. On Friday 775 shares were sold at $24.25@$25. Saturday's market was an improvement, and five shares sold at $26. Monday's sales amounted to 122 shares at $25.75@$26. The market has since been very quiet, but is still weak at $24.50. Its weekly shipments of bullion amounted to 41 bars, of 55,150 ounces of silver and 103 ounces of gold.

Breen opened at 90c., but soon fell to 65c., owing to the fact that the deal with the English syndicate had been dropped. On Thursday it fell to 57½c., the following day to 55c., then to 50c., and now is held at 52½c. During the week 2,600 shares were sold. Elizabeth opened at $2 15 and is now quoted at $1.85. On the first day it fell to $1.95, and since has fluctuated between 85c. and 87½c. Sales amounted to 6,550 shares. There is no apparent cause for the sudden decline.

Montrose opened at 80c., fell off to 77½c., and then rose to 82½c. Total sales were 200 shares.

Central Silver fell from its usual quotation of 9c. to 7c. Sales amounted to 2,100 shares.

Thirty-five cents was the opening bid on American & Nettie, and it rose to 36c.; but from then on it steadily declined to the present quotation of 31¼c. Six hundred shares were sold this week and its market is weak.

Silver Age managed to go up a few cents, and with an opening bid of $1.90 is now quoted at $1.95. At one time it was as high as $2; 400 shares were sold.

Yuma opened at 52c., and closes at 50c. During the week 200 shares sold at 52½c @53¾c.

Bi-metallic opened at $34, and closes at $33.75. Only one sale of 100 shares at $33.75 was made.

These were the only sales during the week. The market was, on the whole, depressing and few stocks had a rise in prices.

Mountain Key rose from 45c. to 47c., and Hope from $1.95 to $2. Gold King fell from 11c. to 10c. Little Albert remains at 16¼c.

PIPE LINE CERTIFICATES.

(Specially Reported by Messrs. Watson & Gibson.)

The oil market this week has been lower on some new oil discoveries in the West Virginia field and continued development in the old regions of Pennsylvania. The current production is fully equal to to the consumption, as there is no speculation in the product. It is just as fair to suppose that the market will fall as that it will rise, and perhaps lower prices are sufficiently probable to justify sales.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 7	76⅝	76⅝	76½	76⅝	9,000
9	76½	76¾	76⅜	76⅜	20,000
10	76⅞	76⅞	76¼	76½	20,000
11	....	....	....	....	.....
12	74	74¾	73	73	65,000
13	72½	74	72½	73⅝	29,000
Total sales in barrels					144,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 7	76½	76½	76½	76½	5,000
9	76⅛	76⅛	76⅛	76⅛	6,000
10	76	76	76	76	2,000
11	....	....	....	....	.....
12	....	....	....	....	.....
13	....	....	....	....	.....
Total sales in barrels					13,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 13.

STATEMENT of shipments of anthracite coal (approximated) for the ten days ending March 7th, 1891, compared with corresponding period last year:

Regions.	March 7, 1891.	March 8, 1890.	Difference.
Wyoming Region. Tons	308,102	237,012 Inc.	71,090
Lehigh Region "	122,002	76,714 Inc.	45,288
Schuylkill Region "	160,905	127,804 Inc.	33,101
Total Tons	591,009	441,530 Inc.	149,479
Total for year to date Tons	6,116,175	4,664,337 Inc.	1,451,838

PRODUCTION OF BITUMINOUS COAL for week ending March 7th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1891. Week.	1891. Year.	1890. Year.
Phila. & Erie R.R.	1,897	29,114	27,385
Cumberland, Md.	†89,880	708,718	720,369
Barclay, Pa.	3,217	29,963	24,521
Broad Top, Pa.	11,573	120,933	108,*38
Clearfield, Pa.	73,696	828,783	790,762
Allegheny, Pa.	26,315	244,963	211,155
Beach Creek, Pa.	†43,273	442,313	346,491
Pocahontas Flat Top	45,083	400,285	331,146
Kanawha, W. Va.	†51,147	387,389	354,295
Total	346,081	3,192,491	2,914,660

* Estimated
† Week ending February 28th.

WESTERN SHIPMENTS.

Pittsburg, Pa.	18,594	198,676	169,206
Westmoreland, Pa.	35,432	376,155	356,288
Monongahela, Pa.	11,495	108,694	44,646
Total	65,401	683,525	569,850
Grand total	411,482	3,873,016	3,484,500

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending March 7th, 1891, and year from January 1st, in tons of 2,000 lbs.: Week, 70,933 tons; year, 670,853 tons; to corresponding date in 1890—1,057,926.

Anthracite.

The outputs for the week ending March 7th aggregated 591,009 tons, an increase of 149,479 tons over the corresponding week of last year, making 6,116,175 tons this year to date, an increase of 1,451,838 tons over the corresponding period of 1890. This showing is not quite as good as the one made the week previous, at which time the excess was 87,975 tons. However, it is but 91,009 tons over the quota fixed by the Sales Agents for the week in question, and is pronounced by them to be a general improvement over previous records. Some of the companies made a most heroic effort to curtail their productions and succeeded in running under their allotment.

The Sales Agents held a meeting on the 12th inst., at which the situation was considered in a session of two hours. The sentiment expressed was that the companies were all making an honest effort to curtail outputs and maintain prices. Also that there was a disturbing element in the trade which needed looking after. Reference is made to the small operators, who are said to be selling at rates ranging from 20 to 50 cents per ton below the September circular prices, the ruling rates of the Sales Agents. It is said that these operators are allowed but about 7% of the output. Nevertheless, under present conditions they are monopolizing all of the small trade that there is to be had. A few of the Sales Agents were quite ardent in their desire to have prices lowered at this meeting, for the purpose of meeting this competition and other conditions of the market; but the large majority decided to defer action until the meeting to be held on March 31st, at which time Spring prices will be fixed.

Bituminous.

The soft coal market seems to be in a state of suspension. Neither buyer nor seller knows exactly what the immediate future will bring forth, and each seem to be content to bide his time. The operators have up to this time cherished the hope that after all the railroad companies would not insist on an advance in freight rates. Word now comes that the advance of from 15@25c. per ton, to go into effect April 1st, has all but officially been announced, and that the official circular will be issued in a few days. Until such time there will be no trade except on old contracts, and to supply immediate demands.

The prices fixed by the Seaboard Association are set forth in the following circular:

"On and after this date the following prices are established as the minimum prices at the several shipping ports:

"Sec. A.—F. o. b. at Philadelphia, Norfolk, Newport News, Baltimore, and Georgetown, $2.50 per ton of 2,240 pounds.

"Sec. B.—F. o. b. at South Amboy, Perth Amboy, Jersey City, Weehawken, Hoboken, and Port Liberty, for shipments to points outside of the harbor of New York, and also destined to points on the Hudson River north of Fifty-seventh street, and to points on the East River east of Hell Gate, $3.07½ per ton of 2,240 pounds.

"Sec. C.—F.o.b. at Elizabethport and Port Johnson for shipments to points on the Hudson River north of Fifty-seventh street, and to points on the East River east of Hell Gate, $3 per ton of 2,240 pounds.

"Sec. D.—F.o.b. at South Amboy, Perth Amboy, Elizabethport, Port Johnson, Jersey City, Weehawken, Hoboken, and Port Liberty, for shipments to points on the North River, south of Fifty-seventh street, and to points on the East River west of Hell Gate, $3.10 per ton of 2,240 pounds; but all sales made as delivered alongside in the harbor of New York south of Fifty-seventh street, North River, and on the East River west of Hell Gate, shall not be less than $3.25 per ton of 2,240 pounds so delivered.

"No coal shall be sold and no contracts be made by any member of the association, or by any agent of any member, at any price which shall include the delivery of the coal to any point other than the shipping port where such coal may be loaded, except only such coal as is sold delivered in the harbor of New York, as provided for in section D."

From section A it will be seen that the price f. o. b. at Philadelphia is the same as at Norfolk, Newport News, Baltimore and Georgetown. The water freight rates from the first-named port are $1.00 to $1.05 while at the other ports they are $1.10 to $1.15—there always being a difference of about 10 cents. In consideration of this the circular prices seem to be a discrimination. Already the natural law has become operative, nominally fixing the Philadelphia price at $2.60 and at other ports $2.50. A few, and only a few, contracts are being made at these prices. Large stocks are accumulating at tidewater.

The agitation which has been going on in the Clearfield and Cumberland regions has culminated in a circular, addressed to the operators and miners whose product goes to the eastern seaboard. It is signed by John B. Rae, president of the United Mine Workers of America, and reads as follows: "You are respectfully informed that a convention of operators and miners will be held in Cumberland, Md., commencing Wednesday, March 18th, 1891. The objects of the convention

will be to fix rates for mining, correct inequalities, and establish such conditions as will do away with needless agitation and establish greater harmony between employer and employed."

The Connellsville coke strike entered upon its fifth week on Monday. Predictions as to its probable outcome are a little conflicting. Local coal men claim that the few independent operators who recently started up their works at old prices pending a settlement of the strike will be followed by others of the same class, and that their action will have a tendency to dishearten the strikers and induce the larger operators to resume in order to retain their full share of business, thus bringing each party to the controversy to a desire for a settlement.

Manager Lynch, of the H. C. Frick Coke Company, is quoted as having said on Monday that he was receiving many applications for work, but owing to the depressed situation his company would not resume even at a 10% reduction.

The Pittsburg *Times* prints the following dispatch from Scottsdale concerning the strike: "The indications are for a long struggle. National Secretary McBride, of the United Mine Workers, to-day notified District Secretary Parker that $3,000 would be supplied weekly to the strikers in need."

The coke market is beginning to feel the effect and prices are higher than those set forth in the March circular are expected.

NOTES OF THE WEEK.

The average of coal prices for the Schuylkill district in February was $2.31¼. In January the average was $2.33·9 and in February last year it was $2.32·9.

The United Mine Workers' Convention has been called to meet in Pittsburg on the 7th prox. The 'eight hour day" question will be the chief one which will come up for consideration.

It is said that the Reading Coal and Iron Company has suspended operations indefinitely in six of its collieries; namely, the Alaska, Otto, Franklin, Richardson, Bear Valley, and Buck Ridge. This is done with a view of curtailing the output.

It is said that Mount Carmel shaft colliery, one of the largest in Mount Carmel region, suspended indefinitely on Saturday, March 7th, owing to the depressed condition of the coal trade. One thousand men are thrown out of employment.

The Retail Coal Exchange, at a semi-monthly meeting held on the 6th inst., elected Mr. E. J. Shelly to membership. The firm of Bunke & Cording was proposed for membership. Among other business transacted was the report of the committee on the fourth annual coal trade dinner, and the matter of prices on the west side in the Harlem district. The latter question was referred to a committee which was authorized to adjust differences.

The management of the Cresson & Clearfield Coal and Coke Company has secured control of the Cambria Coal and Coke Company. The New York business will be conducted by Mr. C J. Wittenberg, the general sales agent of the purchaser.

The Berwind-White Coal Mining Company, 55 Broadway, has purchased from the Kiataxing Coal Company a strip of ground comprising about four acres adjacent to its mill site at Osceola, Pa., and will erect thereon, during the coming summer, car shops which will employ from 40 to 50 men.

The end of the coal strike in the Monongahela Valley will have a marked effect on Western and Southwestern trade. An account of the settlement will be found in our news columns.

On February 10th the President approved an Act of Congress which was an amendment to the Interstate Commerce Bill, and designed to give and define the right of the Interstate Commerce Commission to inquire into the management of the business, etc., of common carriers. Inasmuch as it has a direct bearing on the coal-carrying trade, it is given in substance in this column. The amended sections of the original bill stand as follows:

"SEC. 12. The commission hereby created shall have authority to inquire into the management of the business of all common carriers subject to the provisions of this act, and shall keep itself informed as to the manner and method in which the same is conducted, and shall have the right to obtain from such common carriers full and complete information necessary to enable the commission to perform the duties and carry out the objects for which it was created; and the commission is hereby authorized and required to execute and enforce the provisions of this act; and, upon the request of the commission, it shall be the duty of any district attorney of the United States to whom the commission may apply to institute in the proper court and to prosecute under the direction of the Attorney-General of the United States all necessary proceedings for the enforcement of the provisions of this act and for the punishment of all violations thereof, and the costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States; and for the purposes of this act the commission shall have power to require, by subpœna, the attendance and testimony of witnesses and the production of all books, papers, tariffs, contracts, agreements and documents relating to any matter under investigation.

"Such attendance of witnesses, and the production of such documentary evidence, may be required from any place in the United States, at any designated place of hearing, and in case of disobedience to a subpœna the commission, or any party to a proceeding before the commission, may invoke the aid of any court of the United States in requiring the attendance and testimony of witnesses and the production of books, papers and documents under the provisions of this section.

"And any of the circuit courts of the United States within the jurisdiction of which such inquiry is carried on may, in case of contumacy or refusal to obey a subpœna issued to any common carrier subject to the provisions of this act, or, other person, issue an order requiring such common carrier or other person to appear before said commission (and produce books and papers if so ordered) and give evidence touching the matter in question; and any failure to obey such order of the court may be punished by such court as a contempt thereof. . . .

"The testimony of any witness may be taken, at the instance of a party, in any proceeding or investigation depending before the commission, by deposition, at any time after a cause or proceeding is at issue on petition and answer. . . . Every person deposing as herein provided shall be cautioned and sworn (or affirm, if he so request) to testify the whole truth, and shall be carefuly examined. . . . If a witness whose testimony may be desired to be taken by deposition be in a foreign country, the deposition may be taken before an officer or person designated by the commission, or agreed upon by the parties by stipulation in writing to be filed with the commission. All depositions must be promptly filed with the commission."

A mortgage has been entered in the Recorder's Office of Cambria County, Pa., in favor of the Girard Life Insurance, Annuity and Trust Company, of Philadelphia, against the Cambria & Clearfield Railroad Company, to secure bonds amounting to $2,000,000—the principal and interest payable in gold in 1941. It is said that the road contemplated running from or near Cresson, on the Pennsylvania Railroad, to Kaylor, and thence northwesterly about thirty-five miles down the Chest Creek Valley to McGee's; thence southwesterly up the Valley of the West branch of the Susquehanna some thirty miles to near the mouth of Laurel Lick Creek. There are various branches to be hereafter constructed or acquired in Cambria, Indiana and Clearfield Counties.

The annual meeting of the Arcadia Coal Company, Limited, will be held at the company's office, No. 1 Broadway, on March 25th, for the election of directors and the transaction of other business.

Boston. March 12.

(From our Special Correspondent.)

The anthracite coal market has gradually settled again into the rut in which it has been moving for some weeks past. The improvement noted during the recent cold spell was of a trivial nature, and consisted chiefly of the few orders placed by retailers who were buying small lots to meet the pressing business. While the market continues very quiet, the outlook for the summer and fall trade is promising. Spot stocks here are not very large at present, and are being gradually diminished, so that it is expected by the end of the present season the spot supply will be very small. Agents appear anxious to sell coal and claim to have unlimited amounts to offer; but this is no inducement to buyers, who are keeping out of sight, and for some reason refuse to avail themselves of the favorable market.

Bituminous coal is practically at a standstill. The market remains quiet, and, although the pool price has been decided upon, there is but little of interest transpiring in the market. The price, $2.50 f. o. b., is a trifle less than last year's figure. Stock is offering freely, but very little is being done on contracts. Agents are asking full prices, and apparently are not worrying over the absence of the business, which they feel will soon show itself. The gas coal situation continues unchanged, most of the local companies being well stocked.

Freights continue fairly steady. There are plenty of vessels offering, for which there is but little call, owing to the quiet condition of the market. From New York 65c.@75c. is quoted, from Philadelphia $1, and from Baltimore $1@$1.10.

The demand at retail has been very good, and it has helped to diminish the large stocks which the retailers were supposed to have. The appearance of mild weather has caused a lull in the inquiry, which is at present comparatively light.

The receipts of coal at this port for the week ending March 7 were 22,242 tons of anthracite and 24,224 tons of bituminous, against 16,155 tons of anthracite and 17,943 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 185,302 tons of anthracite and 210,732 tons of bituminous, against 144,278 tons of anthracite and 165,931 tons of bituminous for the same time last year.

Buffalo. March 12.

(From our Special Correspondent.)

There is little news to report concerning the trade or prices of coal at this point. Lake navigation prospects are of a gloomy character. A well posted man says: "There are no lake freights taken, yet of any description, unless an occasional charter has been made privately." A report comes from Cleveland, O., that "the Ashland ore rate will be fixed at $1, and that season charters will be made in ten days or so, but it will have to be done before anybody takes much stock in the prediction. With only corn enough in Chicago elevators to load two or three vessels, there is no hope from that quarter."

Cleveland coal shippers are seeking tonnage to load immediately at Cleveland and Toledo, especially for Duluth and Milwaukee; 50c. is offered to Lake Superior and 55@60c. to Lake Michigan ports; but few, if any, boats have been secured on account of the expense of moving them so early. It is said that anticipated troubles among the miners is the cause of the coal shippers being so anxious to ship before May 1.

Vessel owners met last Saturday to talk over the freighting business for the season of 1891. It was finally arranged that an association should be formed and some agreement entered into to prevent a too early movement of vessels in view of the poor outlook. Another meeting was held Monday, and a "Buffalo Vessel Owners' Association' formed.

Mr. John J. McWilliams, the coal agent of this port for the Delaware, Lackawanna & Western Railroad, has returned from a well-earned, lengthy vacation, spent with his family on the Pacific coast. The Philadelphia & Reading Coal and Iron Company has made an important change at Milwaukee. The firm of F. R. Buell & Co. has discontinued business and its successor is the company named, with Mr. F. R. Buell as the resident manager thereof. The company will build a large plant at Milwaukee, comprising docks, sheds, tracks and all the modern facilities for receiving and shipping its coal; in the meantime the old docks, etc., will be used. Mr. Buell has been a prominent coal shipper for many years at Milwaukee, having a large trade there as well as throughout the northwest. The firm of Buell & Pynchon has also been dissolved; but of the latter, Mr. John Pynchon, will continue the coal business alone.

The Buffalo Common Council have agreed to pay for the current year, commencing March 1st, 40 cents per night for each electric light and $1.20 per 1,000 cubic feet for gas. The bids of all the companies were uniform.

The Water Commissioners have decided to make a general reduction of 15% on all water bills for the year commencing May 1st next.

Chicago. March 11.

(From our Special Correspondent.)

Coal.—Trade has been very satisfactory in this market during the past week. While the movement is not large, it is steady, and dealers seem well satisfied, considering the time of year and previous poor condition of the trade. Prices continue to show weakness in the wholesale trade, owing to the desire to decrease stocks as much as possible. The Coal Exchange has reduced the retail price of anthracite coal 50c. per ton. Prices per ton of 2,000 pounds f. o. b. Chicago are: Lehigh lump, $6.75; large egg, $5; small egg, range and chestnut, $5.25. Retail prices are: Large egg, $6.25; small egg, range and chestnut, $6.50.

The bituminous trade is more active than the anthracite, owing to its continued use for steaming purposes, while the market for anthracite is continually decreasing for house use. Prices per ton of 2,000 lbs. f. o. b. Chicago are: Pittsburg, $3.30; Hocking Valley, $3; Youghiogheny, $3.40; Indiana block, $2.40@$2.60; Illinois block, $2@$2.20.

Coke is now very scarce in this market, and the local furnaces are preparing to close down. Some of the smaller plants of W. P. Read & Co. are still in operation, but their output does not come near supplying the demand. The news concerning the strike is very meager at this end. Prices are nominal: Connellsville, 72 hours, $5.05; gashouse coke, $4.25; crushed, $5.

Pittsburg. March 12.

(From our Special Correspondent.)

Coal.—The local demand is rapidly increasing on account of the shortage of gas. It now requires fully 200,000 bushels coal per day to supply Pittsburg and vicinity. The coal strike in the Monongahela Valley has been settled; the miners resumed work on Monday. The supply of Pittsburg coal in the South has been reduced at New Orleans and Memphis to six barges, 206 boats. The railway coal trade has fallen off very materially, but it is expected to improve by the middle of April, when the late trade opens. Prices at Pittsburg are: River, $4.50@$5 per 100 bushels; railroad, $5@$5.50.

Connellsville Coke.—The situation is without notable change, though a few of the small operators have started up. The large ones are all idle; they show no disposition to resume at the old rates, and are still insisting on the 10 per cent. reduction in wages. The number of idle ovens in the region is estimated at 15 000, the active ones about 800. On account of the flatness of trade the operators do not seem anxious to resume. They say that the wage question is now a secondary consideration with them. The week's business amounted to 3,456 tons, distributed as follows:

West, cars—73; East, 113; Pittsburg, 6; total, 192 cars. Freights and prices are the same as have been current for some weeks.

FREIGHTS.

From Philadelphia to: Boston.* $1.00; New York,† 90c.; Norfolk, 55c.; Richmond, 60c.

*And discharging.
†Alongside.

METAL MARKET.

NEW YORK, Friday Evening, March 13.

Prices of silver per ounce troy.

Mar.	Sterling Exch'ge.	Lond'n Price.	N. Y. Cts.	Mar.	Sterling Exch'ge.	Lond'n Price.	N. Y. Cts.
7	4 87½	44¾	97⅜	11	4.87½	45⅛	98⅛
9	4.87½	45	98¼	12	4.87½	45 3-16	98¾
1	4.87½	45 1-16	98¼	13	4.87¾	45 5-16	99

The market has been firmer, with an upward tendency, occasioned by demand from the East. Exchanges between London and Bombay have made corresponding advances.

The United States Assay Office at New York reports total receipts of silver for the week to be 54,000 ounces.

Government Silver Purchases.

The Treasury Department informs us, that the amount of silver purchased by the government during the past week was as follows:

	Offered, ounces.	Purchased, ounces.	Average price.
March 9	1 889,000	570,000	$·9862
" 11	777.000	365,000	·9895

WASHINGTON, D. C., March 13th (By Telegraph).—The Treasury Department purchased 303,000 ounces of silver to-day.

Silver Bullion Certificates.

	Price. H.	L.	Sales.
March 7	98⅛	98	215,000
March 9	98¾	98¼	145,000
March 10	98⅝	98½	220.000
March 11	98⅞	98⅝	235,000
March 12	98⅝	98⅞	446,000
March 13	99½	99½	321,000
Total sales			1,582,000

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .76	$ .79
Mexican dollars	.77	.79
Peruvian soles and Chilian pesos	.73½	.75
English silver	4.86	4.88
Five francs	.94	.95
Victoria sovereigns	4.86	4.89
Twenty francs	3.85	3.88
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.90
Ten guilders	3.96	4.00
Bar silver	99	99½

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its minimum rate for discount, which remains at 3%. In the week the bank gained £183,000 bullion, and the proportion of reserve to liabilities was raised from 36·80% to 38·59%, against an advance from 48·93% to 51·03% in the corresponding week last year, when its discount rate was reduced to 4%. On the 12th inst. the bank gained £32,000 bullion on balance.

Copper.—There has not been experienced during the week any marked change, from the monotony which has characterized this metal for the last fortnight. The attitude already assumed by the consuming body of manufacturers, on the one hand, and the producers on the other, continues, the former eager to enter contracts at 13c. and the latter holding out firmly for 14c. The problem now to be solved, is where the two will meet. Business from manufacturing centers has been reported as being quite satisfactory, and certainly much better than it has been for the last few months, and were it not for the obstinacy of the manufacturers in insisting upon getting lake copper at 13c., this being apparently the figure at which export sales have been made, it is hardly to be doubted that the market would have assumed more of a settled condition. Some orders have been placed at the higher figure, which seems but natural, seeing that, with the exception of a few, manufacturers are almost bare of supplies, especially as far as wire bars and cakes are concerned. Ingots have been secured second hand in smaller quantities at a somewhat lower figure, say about 13¾c., but the official quotation must be called 14c. Arizona copper is in fair demand, the consumption of this grade having considerably increased, but supplies are not adequate to meet the demand. We quote ingot at 13c @13¼c. and pig copper at 11¼c.@11⅜c. Casting copper is somewhat more pressed for sale again and holders have had to make concessions. We quote 11¼c.@11⅜c.

The London market, which had shown all along a very firm tendency, has suddenly given way to a weaker feeling, brought about, as we are informed, by the unexpected reappearance of financial difficulties both in England and in France, and although, according to cables received to-day, a crisis appears to have been averted, the influence on business in general was severely felt, and the speculative market has, under the circumstances, been subject to bearish influences. G. M. Bs, which closed last week at £52 10s. for spot and £52 12s. 6d. for 3 months, opened on Monday at £52 5s. for spot and closed yesterday at £51, the lowest point touched for a considerable time past, but closes to day at £51 12s. 6d., in consequence of the more reassuring condition of the financial situation. English Tough, £54@£54 10s.; Best Selected, £56 10s.@£57; Strong Sheets, £62 10s.@£63; India Sheets, £59@59 10s.; Yellow Metal Sheets, 5¾d.

The exports of copper during the past week were as follows:

To Liverpool—	Copper Matte.	Lbs.	
By S. S. Nevada	1,817 bags	209,757	$15,000
" Runic	5,388 "	571,075	40,000
" Sirius	1,443 "	167,993	10,000
To Liverpool—	Copper.		
By S. S. Nevada	225 casks	281,250	38,500
" Adriatic	110 bbls.	125,000	17,500
To Hamburg—	Copper.	Lbs.	
By S. S. Rhaetia	2 kegs	1,000	125
" Taormina	5 pckgs. (old)	5,299	583
To Stettin—	Copper.	Lbs.	
By S. S. Italia	90 casks	112,500	17,000
" "	98 cakes	11,272	1,700
To Amsterdam—	Copper.		
By S. S. Amsterdam	1,277 bars	175,386	24,553
" "	384 cakes	109,057	15,268
" "	885 pigs	260.400	36,456
" "	100 bbls.	125,000	17,500
" "	2 kegs	1,000	125
To Havre—	Copper.	Lbs.	
By S. S. La Champagne	1,087 bars	270,858	37,175
" "	136 casks	169,240	24,993
" "	100 bbls.	125,000	17,500
" "	860 pigs	138,168	19,256
To Rotterdam—	Copper.	Lbs.	
By S. S. Veendam	205 cakes	33,542	5,000
" "	136 cakes	22,411	3,500

Tin.—This metal has been subject to but slight fluctuations, about holding its own. The scarcity of spot and March has apparently continued, and notwithstanding that one steamer with about 400 tons has arrived since we last reported, the market for these deliveries has remained very firm indeed, that arrival having been discounted for some time past. Shipments from the East continue on a steady scale, but it is supposed that heavy quantities are being held back partly on account of lack of freight room, but also with the view of realizing better prices. While London has lost some of its recent advance, our market has not followed; but this may be explained by the fact that prices here have not been on a parity, but below those ruling abroad. We quote spot, 20·15; March, 20·15; April, 19·95; May, 19·95; June, 20.

The London market which closed last week at £90 5s. opened on Monday at £90 5s., and closed to-day at £90 5s., spot; £90 10s., 3 months. Business in both markets has been of a limited character.

Lead.—The dullness which prevailed of late has been at last interrupted by a livelier kind of trading, several hundred tons having changed hands at the beginning of the week at about 4·32½, and sellers have now withdrawn; at least, they are not quoting in harmony with the present state of the market. There has been a great deal of quibbling over the bullion question, and the larger amount of business done has, to some extent, been due to this very fact. It was attempted to put that quotation down to 4·30 and 4·25, but no quantities of lead being offered in the open market, the quotation had to be re-established at 4·32½, at which the bulk of the business was done, and at which figures there remained buyers.

The London market continues unchanged at £12 10s. for Spanish and £12 15s. for English.

St. Louis Lead Market.—Messrs. John Wahl Commission Company telegraph us as follows: "We continue to have a tame and uninteresting lead market. Values are unchanged; retail sales are being made daily at about 4·07½c., with an occasional car bringing 4·10c."

Spelter.—Spelter has continued steady. Pressure to sell on the part of smelters has entirely relaxed, and the market in consequence has presented a more reassuring aspect A better demand has sprung up, which has been supplied at prices ranging from 5⅛@5·15 New York. Nothing is obtainable now below the latter figure.

In London the quotations are: Ordinaries, £23 10s.; specials, £23 15s.

Antimony.—This is again somewhat easier, demand having fallen off and pressure to sell forward deliveries being more apparent both here and abroad, especially of grades other than Cookson's, L. X. and Hallett's. We quote: Cookson's, 17¾; L. X., 16¾; Hallett's, 16.

Aluminum.—The Pittsburg Reduction Company, of Pittsburg, Pa., announces that it has reduced the price of aluminum to $1 per pound, in quantities of any size. This step is taken with a view to developing a larger market than there is at present, since at the new price it may be economically used for very many purposes.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 13.

The general inactivity which has characterized the iron market for so long has become even more pronounced during the past week. Consumers have been in the market only to fill their immediate requirements, and orders have been for small lots only. All business has been of this hand-to-mouth nature; of speculative buying there is none at all. Notwithstanding this condition of affairs, prices have held firm, probably on account of the coke strike, which still continues, and the somewhat lesser quantity of iron which is offering. The strike is not apparent in this market in any other way, and even this influence, small as it is, is not likely to be more than temporary.

According to published reports, the monthly production of pig iron is now more than 200,000 tons less than it was on the first of December, 1890, at which time the maximum of the past year was attained. The number of furnaces now in blast is fewer by 80, or more, than at that time. Notwithstanding this enormous decrease in production, however, the expected improvement in the market has not come.

The fact is now indisputable that consumption has fallen off, and although there is no exact measure of this, the decline has evidently been large. In view of these facts it is now clear that it is idle to look for any higher prices, and with the settlement of the coke strike the prospects are for a further decline. A readjustment of things upon a new basis is now going on. The railway companies have already made concessions in freight rates from Pittsburg, and the price of Lake Superior iron ore has also been reduced. Indeed, with the present condition of business in this country, everything points toward cheaper iron.

American Pig Iron.—The market continues to be dull, and sales agents report comparatively few orders. Prices, however, remain firm, and there is no shading being done on any of the standard brands. The supply of Southern foundry irons continues to be very limited, and dealers have difficulty in filling orders. We quote prices unchanged from last week: Northern iron, No. 1 X, $17.50@$18; No. 2 X, $16.50@$17; Southern iron No. 1 X, $18; No. 2 H, $16@$16.50.

Spiegeleisen and Ferro-manganese.—There has been very little doing, and no sales of any consequence have been reported. We quote prices nominally: 20% spiegeleisen, $28.50@$29; 80% ferro manganese, $62.50@$63, at tidewater.

Steel Rails.—The event of the week has been the final consolidation of Lackawanna Iron and Coal Company and the Scranton Steel Company, which, as we stated last week, was still possible notwithstanding the hitch in the negotiations which was published at that time. The difficulties which arose were settled at the meeting of the two companies last week and the consolidation has now been ratified. The new organization is called the Lackawanna Steel and Iron Company. With this combination thus consummated there is now apparently nothing standing in the way to prevent the putting into effect of the agreement entered into by the various rolling-mill companies, several weeks ago, for the regulation of production and the consequent maintenance of prices. The agreement provides for an allotment on certain fixed percentages to each mill, the sales being distributed at the end of each month, accordingly. Any excess of the allotment is paid for by the mill and an allowance is made for deficiencies. The price at which the mills shall sell is not fixed, but of course the agreement amounts to the same thing as a combination to raise prices. Mills are now holding rails firmly at $30. No transactions of importance are reported, however. The railway companies are still holding off and apparently buying nothing that they can possibly dispense with.

Rail Fastenings.—Trade continues dull, and nothing but small transactions are noted. Bolts and square nuts and hexagonal nuts are off somewhat in price on some small sales of the week. We quote: Spikes, 2c.; angle plates, 1.70@1.80c.; bolts and square nuts, 2.65c.; hexagonal nuts, 2.85c.; complete joint, iron and steel, according to weight.

Tubes and Pipe.—Business continues in its regular course, and is as good as is expected at this season of the year. We quote discounts on carload lots as follows: 47½% on butt, black; 40% on galvanized; 60% on lap, black; 47½% on lap, galvanized; boiler tubes: 50% on all sizes; casing, all sizes, 50%.

Structural Iron and Steel.—There is not much activity in this market and few new orders are reported. We quote prices as follows: Universal plates, $2.20; bridge plates, $2.15; angles, $2.20; beams, $3.10.

Merchant Steel.—Many good orders have been placed during the week and dealers express themselves as satisfied with the present condition of the market. Prices are firm, but unchanged, and we quote as last week: Best English tool, 15c. net; American tool steel, 7@8c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·60c.; open-hearth spring, 2·60c.; tire steel, 2·60.; toe calks, 2·60c.; flat file, 4½c.; mill file, 4½c.; taper file, 7c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—Old rails continue to be very dull

and only small lots have been sold. The price remains $22@$23 for tees and $25 for doubles.

Wrought Iron Scrap.—There is very little doing and the market is lifeless. We quote from $21@$22, at yards.

Chicago. March 11.

(From our Special Correspondent.)

The iron trade has not been as active this week as last, particularly in raw materials. Trade in manufactured iron, however, is still very satisfactory to most of the merchants here.

Pig Iron.—The pig iron market is very quiet this week, and very little business is reported. Large consumers seem to have laid in good stocks, while many of the local furnaces report their inability to make further shipments, owing to the exhaustion of their stocks. Local charcoal irons still remain very quiet. The present prices on metal of this class cannot long remain, as cost has been reached, and in some cases exceeded, by the extremely low prices which are ruling. The prices of Southern irons are still very firm, and some dealers report to be well sold up into the future.

Prices per gross ton f. o. b. Chicago are: Lake Superior charcoal, $18@$18.50; Lake Superior coke, No. 1, $16; No. 2, $15.50; No. 3, $15; Lake Superior Bessemer, $17; Lake Superior Scotch, $17; American Scotch, $18.50@$19; Southern coke, Foundry No. 1, $16.25; No. 2, $15.75; No. 3, $15.25; Southern coke, soft, No. 1, $15.75; No. 2, $14.75; Ohio silveries, No. 1, $18; No. 2, $17; Ohio strong softeners, No. 1, $18.25; No. 2, $17.50; Tennessee Charcoal, No. 1, $18; No. 2, $17.50; Southern Standard Car Wheel, $21@$23.

Structural Iron.—Business continues very good in this branch. Inquiries are being received in good numbers, and a fair proportion of orders are being placed. A decided firmness in the market is to be noticed. Prices for car lots f. o. b. Chicago are: Angles, $2.25@$2.35; tees, $2.75@$2.85; universal plates, $2.40@$2.50; sheared plates, $2.40@$2.50; beams and channels, $3.20.

Plates.—Trade in plates continues fair. Some few orders are being received, but things in general are a little slow. Prices are: Steel sheets, 10 to 14, $2.70@$2.80; iron sheets, 10 to 14, $2.60@$2.80; tank iron or steel, $2.50@$2.70; shell iron or steel, $3.20@$3.40; firebox steel, $4.50@$5.75; flange steel, $3.25@$3.40; boiler rivets, $4.10@$4.25.

Merchant Steel.—Trade this week is again very satisfactory. Orders continue small, but in fair numbers. Prices are: Tool steel, $6.75@$7; tire steel, $2.40@$2 60; toe calk, $2.60@$2.75; Bessemer machinery, $2.20@$2.30; open-hearth machinery, $2.60@$2.75; open-hearth spring, $2.75@$3; crucible spring, $2.75@$4.

Steel Rails.—Business is still fairly good for the time of year. Orders are of course only for immediate wants, but some of good size are now in this market and are being quoted on. Prices are quite firm at $31.50@$32.50 f. o. b. Chicago, and one sale is reported at $33. Splice bars are quoted at $1.95@$2, and spikes at $2@2.10 per hundred pounds.

Galvanized Sheet Iron.—This trade remains in about the same condition as reported last week, and is very good indeed. Consumers seem to be pressed for the receipt of their orders, which the mills are doing their best to fill quickly. Discounts remain unchanged at 67½ off on Juniata and 65% and 5% off on charcoal. Jobbing lots are quoted according to quantity.

Black Sheet Iron.—The market shows some signs of improving, and mills report that they are running moderately full, particularly on roofing orders. Prices: $2.85@$3 f. o b. Chicago.

Bar Iron.—Store sales continue to be effected in good numbers this week. Mill orders, however, are very few and prices unsatisfactory. Few sales are reported. Local mills quote $1.70@$1.80, half extra f. o. b. Chicago, and Valley mills, $1.60@$1.65, f. o. b. mills; freight is 15c. per 100 pounds.

Nails.—Nails continue in good demand, and trade may be considered very fair. The building trade seems to be opening up in some localities, which is bringing some car-load orders into this market. Quotations are: Steel wire nails at $2.20@$2.30; steel cut nails, $1.75@1.85 car loads f. o. b. Chicago.

Tubes.—There is no change to report in tubes this week. Trade continues fair. Boiler tubes are in somewhat better demand. Discounts remain unchanged; two inches and larger, 50%; and 45% for inch and three-quarters and smaller.

Scrap.—The scrap market is very weak and unsatisfactory. Few transactions are reported, and many prices are but nominal. It is easy to buy but difficult to sell. Steel scrap is in a little better shape than the balance of the trade. Quotation sper net ton f. o. b. Chicago are: No. 1 railroad, $19.50@$20; No. 1 forge, $18.50@$19; No. 1 mill, $14@$14.50; fish-plates, $21.50; axles, $24.50; horseshoes, $18.50@$19; pipes and flues, $13@$13.50; cast borings, $8@8.50; wrought turnings, $11; axle turnings, $13; machinery castings, $12; stove plates, $8; mixed steel, $11.25; coil steel, $15.50; leaf steel, $16.25; tires, $8$17@17.50.

Old Rails and Wheels.—Old steel rails are very dull, and no sales are reported. Stocks seem to be light, and those who have them seem inclined to hold for a while. Prices asked are: $19 for long lengths and $14.50 for short lengths. Old iron rails are scarce and also in poor demand, and very little business is reported. Prices may be quoted at $23. Old wheels have been very dull and but little business is reported. They look somewhat weaker. Prices quoted, nominal at $17 per ton.

Cleveland. March 11.

(From our Special Correspondent.)

The ore market has again relapsed into a state of innocuous desuetude. The little excitement caused by the three or four sales of Norrie, Ashland and Aurora to some Wheeling furnace companies, of which the Bellaire Iron Works is one, has passed away, as it was soon found that no other consumers were ready to place their contracts. Some Republic ore has been sold at from $5.50 to $5.75. Two of the new charcoal furnaces have bought ore, in small quantities, for current delivery.

The principal item of news is the determination of the vessel men and ore men not to load any vessels with ore before the 15th of May. This action has helped the situation somewhat, as by thus preventing early ore receipts the docks will be in better condition to receive new ore.

The Legislature of Michigan is causing no little anxiety to those interested in the iron mines of that State. A bill has been introduced taxing the iron mines on their product at the rate of 20c. per gross ton. This is so outrageous and foolish a measure that it was speedily dropped and a new bill offered, which made the proposed tax 4c. a ton instead of 1c. per ton, which is the present rate. This 4c. a ton tax, if made a law, will be very harmful to all the Michigan mines, besides being eminently unjust, if not illegal. The iron-mining men take the stand that they should be taxed for State purposes just as all other property. The tax would be a serious blow to many of the companies mining cheap low-grade ores. The miners are equally anxious, as they fear that their wages would be correspondingly decreased, and they are consequently sending out petitions against the passage of the proposed measure. Quotations remain unchanged from last week and are as follows:

Specular and Magnetic Ores.

Bessemer	66@69%	$5.50@$6.25
"	60@64%	4 25@ 5.25
Non-Bessemer	66@69%	4.75@ 5.25
" "	62@65%	4.00@ 4.75
" "	5?@60%	3 75@ 4.00

Soft Hematites Dried at 212°

Bessemer	62@35%	$4.50@$4.75
"	58@61%	4.00@ 4.25
Non-Bessemer	55@63%	3.50@ 4.25

Above prices are for deliveries on docks at Lake Erie ports.

Louisville. March 7.

(Special Report by Hall Bros. & Co.)

The market in general is about the same as last week; buying has been in a limited way. There has not seemed to be so much desire to purchase iron during present week, and furnaces seem not to care about selling. The market remains firm. We quote prices as last week:

Hot Blast Foundry Irons.—Southern coke, No. 1, $14.25@$14.50; No. 2, $13.75@$14; No. 3, $13.25@$13.50. Southern charcoal, No. 1, $16.50@$17; No. 2, $16@$16.50. Missouri charcoal, No. 1, $17.50@$18; No. 2, $17@$17.50.

Forge Irons.—Neutral coke, $12.50@$13; cold short, $12.50@$13; mottled, $12@$12.25.

Car Wheel and Malleable Irons.—Southern, standard brands, $21@$22; other brands, $17.50@$18. Lake Superior, $21.50@$22 50.

Pittsburg. March 12.

(From our Special Correspondent.)

Raw Iron and Steel.—The market shows no particular change over last week; trading has been fairly active and prices are sustained. As usual, the largest demand has been for the better grades, the prices of which are considered so low that they can scarcely be lower, but the disposition of buyers to stock up at the figures now ruling is not very encouraging to those who have been hoping for a better market. Prices are so various that it is very difficult to quote them with any degree of definiteness, as so much depends on the quantity, quality, delivery, and the anxiety of the seller to secure the order. Cuts are occasionally reported in steel material. It seems improbable that there can be any change in the market for the better unless there is a much larger business than is now promising in the near future. Nevertheless, most of the mills are trying to hold prices about as at present until there shall be some way of getting better rates or cheapening cost.

The steel producers appear to be holding together more firmly than those engaged solely in iron, and the price of both slabs and billets has been held with much firmness at prices quoted since the first of the month. Proposals for a big contract for water pipes for Allegheny City were opened last week, and showed an active competition among cast-iron pipe manufacturers. Bids were made by the Harrison & Howard Iron Company; A Long & Co., R. D. Wood & Co., National Foundry and Pipe Works, and the Addystone Pipe and Steel Company. The contract for the year's requirements was awarded the National Foundry and Pipe Works, of Scottdale.

The Valley furnacemen continue firm in their views, demanding the outside figures for their product. Old steel rails are firm, with liberal transactions. Pittsburgh furnaces are selling Bessemer and gray forge at the advance previously recorded. Billets and slabs are in fair demand, and so is muck bar.

Coke Smelted Lake and Native Ores.

2,000 Tons Grey Forge, Valley Furnace	$14.40 cash.
1,500 Tons Grey Forge	14.75 cash.
1,500 Tons Bessemer, April	16.75 cash.
1,000 Tons Grey Forge, April, May	14.65 cash.
2,000 Tons Bessemer, April, May	17.00 cash.
7,000 Tons Bessemer	17.00 cash
1,000 Tons Grey Forge	15.00 cash
1 000 Tons Bessemer, Valley Furnace	16.25 cash.
1.0 0 Tons Bessemer, Valley Furnace	16.40 cash.
750 Tons Grey Forge	15.00 cash.
700 Tons Grey Forge, March, April	14.75 cash.
500 Tons Bessemer, Spot	16.80 cash.
500 Tons Grey Forge, City Furnace	15.00 cash.
500 Tons Bessemer, City Furnace	17.30 cash.
500 Tons Bessemer	16.75 cash.
500 Tons Grey Forge	15.00 cash.
200 Tons Silvery No. 2	16.00 cash.
200 Tons Grey Forge	15.00 cash.
100 Tons No. 3 Foundry	15.25 cash.
100 Tons No. 2 Foundry, all ore	16.00 cash.
100 Tons No. 1 Foundry, all ore	17.30 cash.
100 Tons Grey Forge, Cold Sheet	14.50 cash.

Charcoal.

100 Tons No. 2 Foundry	21.50 cash.
75 Tons No. 2 Foundry	22.00 cash.
75 Tons WarmBlast	23.50 cash.
75 Tons Cold Blast	26.00 cash.

Steel Slabs, Billets and Blooms.

1,000 Tons Steel Billets	26.50 cash.
7,50 Billets and Blooms	26.60 cash.
500 Billets, March, April, May	26.50 cash.
500 Billets and Slabs	26.25 cash.
300 Slabs and Blooms, April	26.30 cash.

Muck Bar.

1,000 Tons Neutral	27 25 cash.
800 Tons Neutral	27.25 cash.
500 Tons Neutral, March	27.75 cash
300 Tons Neutral	27.50 cash.
300 Tons Neutral	27.75 cash.

Steel Wire Rods.

500 Tons American fives	38.00 cash.

Ferro-Manganese.

50 Tons Domestic 80% Pittsburg	65.05 cash.

Bloom and Rail Ends.

500 Tons Steel Rail Ends	18.50 cash.

Skelp Iron.

400 Tons Narrow Grooved	1.72½ 4 m.
375 Tons Wide Grooved	1.75 4 m.
275 Tons Sheared Iron	2.00 4 m.

Old Iron and Steel Rails.

1,500 Tons Old Steel Rails	18.25 cash.
1,500 Tons Old Steel Rails	18.25 cash.
1,300 Tons Old Steel Rails	18.25 cash.
500 Tons American T's, Valley Mill	25.50 cash.

Philadelphia. March 12.

(From our Special Correspondent.)

Pig Iron.—The general condition of the Pennsylvania iron trade is unchanged. In some quarters it is reported that there is a better feeling, in others opposite opinions are entertained. Quotations for No. 1 Foundry run all the way from $17 to $18, and only moderate lots are being sold. No. 2 runs from $16 to $17. Grey Forge is quoted at $14.50, and, as usual, some brands are selling at $15@$15.25. It is rather surprising that so little change has taken place. A declining tendency in pig iron is once more predicted.

Foreign Material.—Ferro-manganese is quoted at $62, at tide water.

Muck Bars.—No sales of any magnitude have taken place over $26.50; usual quotations, $27.

Billets.—Large buyers declare that they will not pay asking prices, which are $29 for billets and $28 for nail slabs. It is hard to say what shape the business is in. There are rumors that large transactions are about being closed, but nothing of interest or importance can be gathered.

Merchant Iron.—Sales are made in a small way at $1.70@$1.80. The market has a downward tendency, and there is not much prospect for heavy trade for some time yet.

Nails.—Nails are quoted at $1.80@$1.90 at distributing points. Spring buyers are very backward. Brokers say entirely too many nails are being made.

Sheet Iron.—Manufacturers to-day say that they have succeeded in the picking up of a few good-sized orders for immediate delivery. A good summer business is looked for.

Skelp Iron.—A few lots of skelp have been sold at $1.75 for grooved and $1.85 for sheared.

Wrought Iron Pipe.—It was reported to-day that one or two large contracts were about being placed. The small orders coming along are not taken at full price.

Plate and Tank Iron.—The week's orders so far show up a little better, but at prices that are not at all encouraging to mill men. A good deal of material is wanted throughout the country, but there is some very sharp competition, and western Pennsylvania mills are reported as having captured a good deal of business. Ship plate and tank and bridge plate are quoted at $2@$2.10. For steel, $2.10@$2.20; but prices for both iron and steel plate are getting very close together.

Structural Material.—It was expected early in the week that some large orders for structural iron would be placed before Saturday, but according to last reports business negotiations are still hanging fire for some unknown reason. There is

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	.90@.95	$1.50
Balt. & N. C.	.10	.15
Big Vein Coal	....	1.10
Conrad Hill	....	.10
Cons. Coal	.24	.25
Diamond Tunnel	....	....
George's Crk. C.	1.11	1.15
Lake Chrome	.13	....
Maryland & Charlotte	....	....
North State	....	....
Silver Valley	.65	.70@.80

Prices bid and asked, lowest and highest, during the week ending March 12.

Birmingham, Ala. March 11.

COMPANY.	Bid. L. H.	Asked L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co	$100	....
*Alice Furnace	$100	....
Anna Howe G. Mg. Co.	$½	$¾
Bessemer Land	$29	$30
Bir. Mg. & Mfg.	....	$35
Cahaba Coal Mg. Co.	....	$61
Camille Gold Mg. Co.	$¼	....
De Bardeleben C. & I. Co.	$81½	$91½
Decat. L. Imp.	$8¾	$9¼
Decatur Min. L.	....	$19
Ensley Land	$7	$8
*Eureka	....	....
Florence L. & Mg. Co.	....	$18¼
Gadsen Land	$3⅜	$3⅞
Hecla Coal Co.	....	....
Hen. S. & M. Co.	$3	$4½
Jagger-Townl'y C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	....	$25
Sheffield C. & I. Co.	$52½	$55
Sloss I. & S	$18	$22
†Sloss I. & S	$85	$87
‡‡ Sloss I. & S.	$49	$52½
Tuscaloose C. I. & L. Co.	....	$24
Ten. C. & I. Co.	$34	$36
" pref.	$86	$88
Vulcan C. & C. Co	$5	....
Woodstock I. Co.	$28	$29

* Bonds. † First mortgage. ‡‡ Second mortgage. ** Without interest.

Pittsburg, Pa. March 12.

COMPANY.	B.	A.	Closing.
Allegheny Gas Co.	$.....	$.....	$.
Bridgewater Gas Co.	45.00	48.00	45.00
Chartiers Val. Gas.	....	10.00	6.25
Columbia Oil Co.	1.00	3.00	1.00
Consignee Mg. Co.	.20	.50	.20
Consolidated Gas Co.	40.00	.....	40.00
East End E. Light Co.	....	....	....
East End Gas Co	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	....	....	....
La Noria Mining	.25	.26	.26
Luster Mg. Co.	14.50	16.00	15.00
Mansfield C. & C. Co.	....	....	....
Manuf'urers Gas Co.	20.00	25.00	24.50
Nat. Gas Co. of W. Va	57 50	60 00	60.00
N. Y. & Clev. Gas Coal.	38.00	40.00	40.00
Ohio Valley Gas	....	....	....
Pennsylvania Gas	....	11.00	11.00
People's Natural Gas.	....	30.00	30.00
People's N. G. & P. Co.	9.88	10.50	10.00
Philadelphia Co.	12.75	12.88	12.88
Pine Run Gas Co.	....	....	....
Pittsburg Gas	70.00	....	70.00
Silverton Mg. Co.	1.25	1.63	1.50
Sterling Silver Mg. Co.	4.00	5.00	4.00
South Side Gas.	....	....	....
Tuna Oil Co.	55 00	60.00	60.00
Union Gas.	....	....	....
Washington Oil Co.	80.00	85.00	80.00
W'house Brake Co	....	....	....
W'house A. B. Co.	93.00	....	93.00
W'house E. Light.	12.00	12.25	12.25
W'moreland & Camb.	....	....	....
Wheeling Gas.	13.00	16.00	16.00
Yankee Girl Mg	....	....	....

St. Louis. March 4.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$	$2.10
American & Nettie	.11¼	.50
Aztec, N. Mex.	.08	....
Bi-Metallic	....	....
Central Silver	.06½	.07½
Cleveland, Colo.	....	....
Cleveland & An'r.	....	....
Coeur d'Alene	....	....
Elizabeth	2.60	2.75
Gold King	.08	.10½
Granite Mountain, Mont.	....	....
Hope	....	....
Ingram	....	....
L. X. L., Colo.	....	....
La Union	.02	.02½
Little Albert	.15	....
Montrose Placer, Colo.	.47½	.50
Major Budd, Mont.	....	....
Mexican Imp.	....	....
Mickey Breen	.75	.80
Mountain Key	....	....
Nellie	....	....
Old Colony	....	....
Pat Murphy, Colo.	.02½	.03½
Puzzle	....	....
Richmond Hill	....	....
Samoa	....	....
Silver Age, Colo.	1.40	1.50
Small Hopes, Colo.	.85	....
Tourtelotte	....	....
West Granite, Mont.	....	....
Wire Patch	.13	.14½
Yuma, Ariz.	.46¼	.50

Trust Stocks. March 13.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.	
Am. Cotton Oil. Com.	$21 @$21½
" " " Pfd.	46 @ 49
" " " Tr. Repts	23 @ 23½
Sugar Refineries, Tr. Repts.	.... @ ....
Am. Sugar Refineries, Com.	75¼@ 75⅛
" " Pfd.	85¼@ 85¾
Distillers' & Cattle Feeders'.	44¾@ 45¼
Linseed Oil	39 @ 40
Standard Oil	163 @164
National Lead	18¾@ 19
Cattle Trust	....@ ....

Trust Receipts.

Sales at the New York Stock Exchange week ending March 13:

	Sales.	Price H.	Price L
*American Cotton Oil	800	23	22¾
National Lead	11,697	19¼	18⅝
*Sugar	200	84¼	84

* Trust receipts.

Foreign Quotations.

COMPANY.	London. Highest.	Feb. 27. Lowest.
Almada, Mex.	£¼	£⅛
Amador, Cal.	8s.	7s.
Appalachian, N. C.	4¼d.	1¼d.
Canadian Phos., Can.	£½	£¼
Colorado, Colo.	3s. 9d.	3s. 3d.
Comstock, Utah.	....	....
Cordova	....	....
Cons. Esmeralda, Nev.	2s. 9d.	2s. 3d.
Denver Gold, Colo.	6d.	....
Dickens Custer, Idaho.	2s.	1s. 6d.
East Arevalo, Idaho.	2s.	1s.
El Callao, Venezuela.	....	....
Elmore, Idaho	1s.	6d.
Garfield, Nev	1s. 3d.	9d.
Jay Hawk, Mont.	1s. 9d.	1s. 3d.
Josephine, Cal.	1s.	6d.
Kohinoor, Colo.	1s. 3d.	9d.
La Luz, Mex.	2s.	1s. 6d.
La Valera, Mex.	£1⅛	£1⅜
Montana Lt., Mont.	13s. 6d.	12s 6d.
New California, Colo.	5s. 3d.	4s. 9d.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s.	6d.
New Emma, S. Utah.	3s. 9d.	3s. 3d.
Newfoundland, N. F.	3s. 6d.	3s.
N. Gold Hill, N. C.	4s.	3s. 6d.
New Guston, Colo.	£3½	£3
New Hoover Hill, N.C.	1s.	6d.
Old Lout, Colo	....	....
Palmarejo, Mex.	11s. 6d.	10s. 6d.
Pinos Altos, Mex.	6s.	5s.
Pittsburg Cons., Nev.	7s. 9d.	7s. 3d.
Richmond Con., Nev.	£1⅝	£1¼
Ruby & Dunderb'g, Nev.	1s. 3d.	9d.
Sam Christian, N. C.	1s. 3d.	9d.
Sierra Buttes, Cal.	4s. 6d.	3s. 6d.
" Plumas Eur., Cal.	£⅝	£½
Sonora, Mex.	....	....
United Mexican, Mex.	6s. 6d.	5s. 6d.
U. S. Placer, Colo.	1s. 3d.	9d.
Viola Lt., Idaho	1s.	6d.
Yankee Girl, Colo.	£¾	£⅝

Paris. Feb. 26.

	Francs.
Belmez, Spain	870.00
Callao, Venez	39.00
Callao Bis., Venez	14.00
East Oregon, Ore	4.25
Forest Hill Divide, Cal	85.00
Golden River, Cal	130.00
" " parts	30.00
Lexington, Mont	102.50
" parts	2 75
Rio Tinto, Spain	585.00
Tharsis, Spain	172.00

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18° ℔ 100 lbs. 80@1.00
Muriatic, 20° ℔ 100 lbs. 90@1.10
Muriatic, 22° ℔ 100 lbs. 1.00@1.20
Nitric, 36° ℔ 100 lbs. 4.00@4.29
Nitric, 42° ℔ 100 lbs. 3.50@4.00
Oxalic, ℔ 100 lbs. 6.50@10.50
Sulphuric, 60° ℔ 100 lbs. 70@.80
Sulphuric, 66° ℔ 100 lbs. 75@.90

Alkali—
Refined, 48 p. c. 1.60@1.65
Refined, 58° 1.55@1.90

Alum—Lump, ℔ lb. 04
Ground, ℔ lb. 05
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10

Ammonia—Sul., ℔ 100 lbs. 3.15
Carb, ℔ lb. 7½@8½

Aqua Ammonia—18° ℔ lb. 4¾
20°, ℔ lb. .6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammoniates—Azotine, ℔ unit 1 95@ 2 06
Blood, dried, red, ℔ unit, west 1 80@ 1 00
low grade, ℔ unit. 1 70@ 1 80
Concentrated tankage, ℔ unit 1 75@ 1 80
Bones, rough, ℔ ton 20 00@23 00
ground, ℔ ton. 25 00@28 00
Bone black, refuse, ℔ ton 17 50@19 50
Kieserite 6 00@ 6 50
Fish guano, dried 18 50@19 00
acidulated 10 00@— 00
wet 8 50@ 9 50
Phosphate rock, f. o. b Char'n 6 00@ 7 25
undried — @ 6 —
dried 7 00@ 7 50
ground 8 00@11 50
Acid phosphate, 14% per unit. 72½@ 75
Arsenic—White, powdered ℔ lb. 3¼@3½
Red ℔ lb. 5¼@ 5½
White at Plymouth, ℔ ton £12 2 6
Asbestos—Am., ℔ ton $50@$300
Italian, ℔ on. c. i. f. L'pool £18@£50
Ashes—Pot, 1st sorts, ℔ lb. 4¼@4½
Pearl 6¼@6½
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5¼c.
Hard Cuban, P ton $28.00
Trinidad, refined, ℔ ton $30.00
Egyptian 8@9
Barium—Nitrate, ℔ lb. 8@8½
Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, ℔ ton. 19½@21.50
Sulph., off color. ℔ ton 11.50@14.00
Carb., lump, f. o. b. L'pool, ton .06
No. 1, Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " 3 15 0
Bleach—Over 35 p. c., ℔ lb. 1.85@1.90
Borax—Refined, ℔ lb. 9¼@9½
Concentrated 7¾@8¾
Refined " Liverpool ℔ ton £29
Brimstone—*See Sulphur.*
Bromine—℔ lb. 37@38
Chalk—℔ ton 1.75
Precipitated, ℔ lb. 4¾@5
China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton 13.50
Chrome Yellow—℔ lb. 10@2
Cobalt—Oxide, ℔ lb. 2.60@2.90
Copper—Sulph. English Wks. ton £20@£21
Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks. £1 15s.
Corundum—Powdered, ℔ lb. 4½@.9
Cream of Tartar—Am. 99%. 22½
Powdered, 99 p. c. 23
Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb. 2¾@3½
Feldspar—Ground, ℔ ton 15.00
Fuller's Earth—Lump, ℔ bbl. 90@95
Powdered, ℔ lb. 1¾@2
Gypsum—Calcined, ℔ bbl. 1.25@1.50
Iodine—Resublimed 2.75
Kainit—℔ ton $9.75@$10
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb. 8½@8¾
Acetate, or sugar of, white 12@13
Nitrate 9@10
Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½
Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½
Magnesite—Greek, ℔ ton 20.00
Manganese—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. 70@72
Metallic Paint—Brown per ton. $20@25
Red $20@25
Mineral Wool—℔ lb 2
Mica—In sheets according to size.
1st quality, ℔ lb. 25@$6.00
Naphtha—Black 60
Ochre—Yellow, "B. F.," ℔ ton, f. o. b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½
Yellow 10@25
Rochelle 1.35@1.50
Washed Dutch 5@—
Washed French 1½@2½
Washed Nat Oxford, Lump 6½@6¾
Washed Nat Oxford, Powder 7@7½
Golden 3¾@4
Domestic ¾@1½
Domestic, for O. C. & W. P. ⅝@1
Oils, Mineral
Cylinder, light filtered 15@20
Dark filtered 14@21
Extra cold test —@—
Dark steam refined 10@18

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston. 6.00@7.25
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00
Phosphorus—℔ lb. 64@65
Precip., red 100@102
white 100@103
Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7
Potassium—Cyanide, ℔ lb 39@40
Bromide, ℔ lb 33
Chlorate, English, ℔ lb 11@14
Chlorate, powdered 13@14
Carb, ℔ lb 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide 2.65@2.70
Muriate, ℔ 100 lbs. 1.82½
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb. 10½@11
Dble. m'ure salt, basis of 48@50%. 1.07½
Sulphate, basis of 90% ℔ 100 lbs. 2.05
Yellow Prussiate 17½@18
Red Prussiate 42@45
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2½
Pyrites—Non-cupreous, p. units 10d.
Quartz—Ground, ℔ ton 14.00@16.00
Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb 6@10
Salt—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bush 25@28
Salt Cake—℔ lb. 70@75
Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8
Silex, ℔ ton 14@25
Soda—Carb Ash, 48% 1.60@1.65
" high test 1.55@1.60
Caustic ash, 48% 1.62½@1.65
" high test 1.60
Newcastle, 48% — @ —
" high test 1.50@1.55
Bicarb, English 3.50@3.75
" American 3@3½
Crystal, carbonate 1.95@2.00
Caustic, 60% 3.40@5.50
" 70% 3.15@3.20
" 74% 3.15@3.20
" 77% 3.25@3.37½
Sal, English 1.17½@1.20
" American 1.10@1.15
Nitrate 1.80@1.85
Prussiate 17½@18
Phosphate .7@18
Stannate 8@15
Strontium—Nitrate, ℔ lb. 9@9½
Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb. 20
Crude Brimstone, 2s., ℔ ton 27 00
Crude Brimstone 3ds, ℔ ton. 26.50
Sylvinit, 23@27%, S. F. P., per unit. 40@42½
Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton. $18@$20
c. i. f. Liverpool, ℔ ton £4 5
Terra Alba—French. 80@85
English 75@80
American, No. 1. @—
American, No. 2. 40@50
Tin—Crystals. 15½@16
Muriate. .8@ 3
Vermillion—American, ℔ lb. 61
English ℔ lb 82@85
Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb. 7
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6¼
Paris, Red Seal, ℔ lb 6½@7
* Spot.

THE RARER METALS.

Aluminum—(Metallic), per lb. $1.50@$2
Sheet, per lb 2.50
Arsenic—(Metallic), per lb .40
Barium—(Metallic), per gram 4.00
Bismuth—(Metallic), per lb. 2.75
Cadmium—(Metallic), per lb. 1.00
Calcium—(Metallic), per gram 10.00
Cerium—(Metallic), per gram. 7.50
Chromium—(Metallic), per gram. 1 00
Cobalt—(Metallic), per lb. 6.00
Didymium—(Metallic), per gram. 9.00
Erbium—(Metallic), per gram 7.50
Gaillum—(Metallic), per gram 140.00
Glucinum—(Metallic, per gram. 12.00
Indium—(Metallic), per gram. 9.00
Iridium—(Metallic), per oz. 7.00
Lanthanum—(Metallic), per gr. 10.00
Lithium—(Metallic), per gram. 10.00
Magnesium—Per lb. 4.50
Manganese—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), ger gram. 5.00
Osmium—(Metallic), per oz. 65.00
Palladium—(Metallic), per oz. 35.00
Platinum—(Metallic), per oz. 20.00@25.00
Potassium—(Metallic), per lb. 28.00
Rhodium—(Metallic), per gram. 5.00
Ruthenium—(Metallic), per gm. 5.50
Rubidium—(Metallic), per gram. 2.00
Selenium—(Metallic), per oz. 1.80
Sodium—(Metallic), per lb. 2.50
Strontium—(Metallic), per gm. .60
Tantalum—(Metallic), per gram. 9.00
Telurium—(Metallic), per lb. 5.00
Thallium—(Metallic), per gram .25
Titanium—(Metallic), per gram. 2.25
Thorium—(Metallic), per gram. 17 00
Tungsten—(Metallic), per oz. 2.25
Uranium—(Metallic), per lb. 5.00
Vanadium—(Metallic), per gm. 22.00
Yttrium—(Metallic), per gram. 9.00
Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000. 3.00@3.50
Jerseys, ℔ 1,000. 4.75@5.25
Up Rivers, ℔ 1,000. 5.00@5.50
Haverstraw seconds, ℔ 1,000. 5.50@6.00
Haverstraw firsts, ℔ 1,000. 6.00@6.25
Fronts, nominal, ℔ 1,000 .... @ ....
Croton 14.00@16 00
Wilmington 20.00@21.00
Philadelphia @22 00
Trenton @22.00
Baltimore .....
Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu. ft. 45@1.25
Granite, Scotch, ℔ cu. ft. 1.00@1.15
Cement—Rosendale, ℔ bbl. 85@1.10
Portland, American, ℔ bbl. 2.15@2.45
Portland, foreign, ℔ bbl. 2.40@2.50
Portland, " special brands 2.60@2.85
Roman, ℔ bbl. 2.75@2.90
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.25@8 50
Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black roofing, ℔ 100 sq. ft. 4.25@5.50
Lime—Rockland, common, ℔ bbl .90
Rockland, finishing, ℔ bbl. 1.10
St. John, com. and finish., ℔ bbl. 85@ .90
Glens Falls, com. and fin., ℔ bbl. 85@1.10
Labor—Ordinary, ℔ day. 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2.50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4.00

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and Amount of last			Dividends. Total paid.	Dividends. Date & amount of last.		
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*			$562,500	Feb.	1891	.05
2	Alice, s. C.	Mont.	10,000,000	400,000	25	*			895,000	Dec.	1890	.05
3	Alma&Nel Wood C.,g	Idaho	300,000	30,000	10	*			60,000	Jan.	1889	.50
4	American & Nettie,c.	Colo.		300,000					150,000	Nov.	1889	.10
5	Amy & Silversmith,s.	Mont.		341,419					247,530	Aug.	1887	.12½
6	Atlantic, c.	Mich.	1,000,000	40,000	25	$280,000	April	1875	$1.00	700,000	Feb.	1891	1.00
7	Argenta, s.	Nev.	10,000,000	100,000	100	335,000	July	1889	.10	40,000	Feb.	1890	.20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*				600,000	Feb.	1891	.10
9	Aurora, L.	Mich.	2,000,000	100,000	20					155,000	Oct.	1887	1.87½
10	Badger, s.	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
11	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
12	Belle Isle, s.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	.15	300,000	Dec.	1879	.25
13	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,978,000	June	1890	.50	15,397,000	April	1876	1.00
14	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1890	.10
15	Bi-Metallic, s.	Mont.	5,000,000	200,000	25					550,000	Mar.	1891	.35
16	Bodie Con., G. S.	Cal.	10,000,000	100,000	100	500,000	June	1890	.25	1,602,572	April	1885	.50
17	Boston & Mont., G.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	1.50
18	Boston & Mont., C. S.	Mont.	2,500,000	100,000	25	*				1,700,000	Feb.	1891	1.00
19	Breece, s.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1890	.01
20	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					127,000	July	1887	.05
21	Bulwer, G.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175,000	Jan.	1884	.10
22	Bunker Hill & Sull.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1883	.06⅔
23	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	198,000	Oct.	1890	.08
24	Calliope, s.	Colo.	1,000,000	1,000,000						140,000	Jan.	1891	.01⅔
25	Calumet & Hecla, C.	Mich.	2,500,000	100,000	25	1,200,000				35,350,000	Jan.	1891	5.00
26	Carbonate Hill, s. L.	Colo.	1,500,000	200,000	10	*				80,000	April	1884	.05
27	Carlisle, G.	N. M.	1,000,000	200,000	5					175,000	Dec.	1888	.12½
28	Castle Creek, G.	Idaho	100,000	100,000	1					51,000	Oct.	1883	.03
29	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*				270,000	May	1884	.10
30	Central, C.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
31	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
32	Colorado Central, s.L.	Colo.	2,500,000	275,000	10	*				406,250	Aug.	1889	.05
33	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.30	20,000	Nov.	1890	.20
34	Confidence, s. L.	Nev.		24,960		328,880	May	1890	.75	199,680	April	1889	1.00
35	Cons. Cal. & Va., G. S.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,466,800	April	1890	.25
36	Contention, s.	Ariz.	12,500,000	250,000	50					12,587,500	Dec.	1884	.25
37	‖Cop. Queen Con., C.	Ariz.	1,400,000	140,000	10					210,000	Feb.	1889	.50
38	Crescent, s. L. G.	Utah	15,000,000	600,000	25					228,000	Oct.	1888	.03
39	Crown Point, G. s.	Nev.	10,000,000	100,000	100	2,425,000	Sept.	1889	.50	11,588,000	Jan.	1875	2.00
40	Daly, s. L.	Utah	3,000,000	150,000	20					1,837,500	Feb.	1891	.25
41	Deer Creek, s. G.	Idaho	1,000,000	200,000	5	*				20,000	June	1889	.05
42	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				41,000,000	Nov.	1887	.10
43	Derbec B. Grav., G. s.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	240,000	Oct.	1890	.10
44	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*				390,000	Oct.	1889	.05
45	Dunstone, G. S. L.	Mont.	1,000,000	200,000	5	*				6,000	Nov.	1887	.03
46	Eclipse.	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
47	Elkhorn, G. s.	Mont.	1,000,000	200,000	5	*				196,875	Dec.	1890	.50
48	Empire Lt., G.	Mont.	500,000	100,000	5					70,500	Oct.	1887	.37½
49	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	550,000	June	1889	.50	4,892,500	Oct.	1890	.25
50	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,458,000	Dec.	1889	.25
51	Excelsior, G.	Cal.	10,000,000	100,000	100	560,000	Sept.	1885	1.00	875,000	Oct.	1890	.25
52	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
53	Franklin, C.	Mich.	1,000,300	40,000	25	220,000	June	1871		960,000	Jan.	1890	2.00
54	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
55	Garfield Lt., G. S.	Nev.	500,000	100,000	5					95,000	April	1888	.12½
56	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	3,388,800	Sept.	1890	.25	2,826,000	Oct.	1870	10.00
57	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	525,000	Jan.	1890	.30
58	Granite, s. L.	Idaho	500,000	500,000	1	*				28,400	Oct.	1890	.02
59	Granite Mountain, s.	Mont.	10,000,000	400,000	25					10,700,000	Mar.	1891	.25
60	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
61	Hale & Norcross, G. S.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50	1,162,000	July	1888	.50
62	Hecla Con., S. G. L. C.	Mont.	1,500,000	30,000	50					1,500,000	April	1889	.50
63	Hel'a Mg.& Red,G.S.L.	Mont.	3,315,000	663,000	5	*				197,973	July	1886	.06
64	Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May	1890	.25	75,000	April	1886	.25
65	Holyoke, G.	Idaho	200,000	200,000	1					27,000	Feb.	1883	.10
66	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,656,250	Feb.	1891	.10
67	Honorine, s. L.	Utah	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
68	Hope, s.	Mont.	1,000,000	100,000	10	*				233,252	April	1888	.25
69	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*				4,300,000	Sept.	1890	.12½
70	Hubert, G.	Colo.	1,000,000	1,000,000	1					247,000	Dec.	1889	.00½
71	Idaho, G.	Cal.	310,000	3,100	100					5,271,200	Jan.	1891	2.00
72	Ideal, s. L.	Colo.	1,500,000	50,000	10	*				15,000	Oct.	1886	.05
73	Illinois, s.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
74	Independence, s.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.30	225,000	Sept.	1879	.25
75	Iron Hill, s.	Dak.	2,500,000	250,000	10	134,000	July	1889	.05	156,250	Nov.	1887	.07½
76	Iron-Silver, s. L.	Colo.	10,000,000	300,000	30	*				2,500,000	April	1889	.20
77	Jackson, G. s.	Nev.	50,000	50,000	100	237,500	Nov.	1880	.30	6,000	Jan.	1891	.10
78	Jay Gould.	Mont.	2,000,000	40,000	5	*				459,000	May	1890	.04
79	Jocuistita, L.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
80	Jumbo, G.	Colo.	2,000,000	200,000	10					35,000	Oct.	1887	.02½
81	Kearsarge, C.	Mich.	1,250,000	50,000	25	190,000	Oct.	1887	1.00	100,000	Jan.	1890	2.00
82	Kentuck.	Nev.	3,000,000	30,000	100	406,363	Aug.	1890	.30	1,350,000	Dec.	1886	.10
83	La Platta, s. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept.	1889	.30
84	Leadville Con., s. L.	Colo.	4,000,000	400,000	10	*				4,423,000	April	1889	.05
85	Lexington, G. S.	Mont.	4,000,000	40,000	100	*				609,000	Jan.	1885	2.00
86	Little Chief, s. L.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
87	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*				1,090,000	Mar.	1890	.50
88	Little Rule.	Colo.	500,000	500,000	1					110,000	Jan.	1891	.02
89	Mammoth.	Utah	10,000,000	400,000	25	110,000		1882	.25	760,000	Jan.	1890	.10
90	Martin White, s.	Nev.	10,000,000	100,000	100	1,225,000	Oct.	1890	.25	140,000	Dec.	1890	.25
91	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*				175,000	May	1888	5.00
92	Matchless, s.	Colo.	500,000	500,000	1	*				15,000	Feb.	1890	.00½
93	May Mazeppa.	Colo.	1,000,000	100,000	1	*				95,000	Feb.	1891	.01¼
94	Minnesotta, C.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
95	Mono, G.	Cal.	5,000,000	50,000	100	750,000	Sept.	1890	.25	12,500	Mar.	1886	.25
96	Montana, L. G. S.	Mont.	3,300,000	660,000	5	*				2,538,222	Jan.	1891	.06
97	Morning Star, s. L.	Colo.	1,000,000	100,000	10	*				90,000	Feb.	1891	.25
98	Moulton, s. G.	Mont.	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
99	Mount Pleasant, s.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
100	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	160,000	Oct.	1889	.20
101	Napa, Q.	Cal.	700,000	100,000	7	*				400,000	Jan.	1891	.10
102	Navajo, G. S.	Nev.	10,000,000	100,000	100	500,000	April	1890	.15	365,000	April	1889	.10
103	New Guston, s.	Colo.	500,000	100,000	5	*				337,500	April	1890	.50
104	N. Hoover Hill, G. S.	N. C.	330,000	120,000	2¾	*				30,000	Dec.	1885	.06⅔
105	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	April	1883	.50
106	North Belle Isle, s.	Nev.	10,000,000	100,000	100	395,000	April	1890	.20	230,000	May	1888	.50
107	North Star, G.	Cal.	1,000,000	100,000	10	*				250,000	Dec.	1889	.50
108	Ontario, s. L.	Utah	15,000,000	150,000	100	*				11,675,000	Feb.	1891	.50
109	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	July	1882	1.00
110	Original, s. C.	Mont.	1,500,000	60,000	25	*				123,000	July	1888	.05
111	Oro.	Colo.	500,000	100,000	5					60,000	June	1890	.20
112	Osceola, C.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,497,500	April	1891	1.00
113	Oxford, G.	N. S.	125,000	125,000	1	*				78,500	Sept.	1888	.02
114	Paradise Valley, G. S.	Nev.	10,000,000	100,000	100	57,000	April	1888	.15	150,000	April	1887	.10
115	Parrot, s.	Mont.	1,800,000	180,000	10					786,000	Feb.	1891	.10
116	Peacock, S. G. C.	N. M.	2,000,000	200,000	10					60,000	Nov.	1886	
117	Plumas Eureka, G.	Cal.	1,406,250	140,625	10	*				2,548,046	Oct.	1889	.37½
118	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
119	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
120	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					1,705,791	Aug.	1890	1.50
121	" com., Q.	Cal.	5,700,000	57,000	100					643,867	July	1882	.40
122	Quincy, C.	Mich.	1,000,000	40,000	25	200,000	Dec.	1862		5,720,000	Feb.	1891	5.00
123	Republic, C.	Mich.	5,000,000	100,000	50	400,000	Dec.	1889	.30	4,312,587	June	1887	1.25
124	Richmond, s. L.	Nev.	1,350,000	54,000	25	*				99,785	Feb.	1880	.50
125	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar.	1886	.50	585,000	Mar.	1886	.05
126	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				100,000	Dec.	1882	.50
127	Robert E. Lee, s. L.	Colo.	10,000,000	500,000	20					4,460,000	July	1869	3.00
128	Savage, s.	Nev.	11,200,000	112,000	100	6,804,000	Nov.	1889	.50	7,500	April	1883	.01
129	Shoshone, s.	Idaho	150,000	150,000	1					1,568,145	April	1888	.12½
130	Sierra Buttes, G.	Cal.	2,225,000	124,500	10					102,000	Jan.	1871	1.00
131	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	6,236,910	May	1890	.50	270,000	April	1889	.10
132	Sierra Nevada, S. L.	Idaho	1,000,000	1,000,000	1	*				40,000	May	1889	.02
133	Silver Cord, G. S. L.	Colo.	4,500,000	450,000	10					270,000	April	1889	.10
134	Silver King, s.	Ariz.	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July	1887	.25
135	Silver Mt. of L. V.	N. M.	500,000	500,000	1					350,000	Feb.	1891	.10
136	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				50,000	Jan.	1881	.25
137	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*				3,162,500	Oct.	1890	.10
138	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	3,595,000	June	1888	.05
139	Standard, G. S.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	155,000	Nov.	1881	.05
140	Stormont, s.	Utah	500,000	500,000	1	*				844,000	Dec.	1887	.30
141	St. Joseph, L.	Mo.	1,500,000	150,000	10	*				1,974,000	Dec.	1890	.02
142	Swansea, G.	Colo.	600,000	60,000	10	*				100,000	Nov.	1881	.30
143	Tamarack, C.	Mich.	1,250,000	50,000	25	520,000	April	1885	3.00	1,670,000	Oct.	1890	4.00
144	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
145	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.10
146	Valenca M.	N. M.	150,000	1,500	100	*				41,250	April	1886	2.50
147	Viola Lt., S. L.	Idaho	750,000	150,000	5					272,500	Oct.	1887	.37½
148	Ward Con., S. L.	Colo.	2,000,000	200,000	10	*				20,000	Dec.	1889	.05
149	Yankee Girl.	Colo.	2,500,000	250,000	10					1,275,000	July	1887	.10
150	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,508,000	Mar.	1889	.50	2,148,000	Aug.	1871	1.50
151	Weeb City, L. Z.	Mo.	55,000	11,000	5					4,400	July	1889	.10
152	Woodside.	Utah								25,000	Oct.	1889	.25
153	Young America.	Cal.								175,000		1889	.10

G., Gold. S., Silver. L., Lead. C., Copper. *Non-assessable. †This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡Non-assessable for three years. §The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia 40,000,000. **Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends.

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and am't of last.		
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*		
2	Allegheny, s.	Colo.	5,000,000	500,000	10			
3	Allegez, C.	Mich.	2,000,000	80,000	25	$237,000	Jan.	1890
4	Alpha Con., G. s.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890
5	Alta, s.	Nev.	10,080,000	100,800	100	3,359,800	Sept.	1890
6	Amador, G.	Cal.	400,000	200,000	2	*		
7	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	June	1887
8	Amity, s.	Colo.	250,000	250,000	1			
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5			
10	Astoria, G.	Cal.	200,000	100,000	2			
11	Barcelona, G.	Nev.	5,000,000	200,000	25	*		
12	Bechtel Con., G.	Cal.	10,000,000	100,000	100	178,500	Jan.	1883
13	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	1886
14	Best & Belcher, G. s.	Nev.	10,080,000	100,800	100	2,279,275	Aug.	1890
15	Big Pittsburg, s. L.	Colo.	20,000,000	300,000	100	*		
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*		
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov.	1883
18	Bremen, s.	N. M.	5,000,000	500,000	10	*		
19	Brownlow, s.	Colo.	250,000	250,000	1			
20	Brunswick, G.	Cal.	2,000,000	400,000	5	*		
21	Bullion, G. s.	Nev.	10,000,000	100,000	100	2,790,000	Dec.	1889
22	Butte & Boston, C. s.	Mont.	5,000,000	200,000				
23	Calaveras, G.	Cal.		500,000	1	*		
24	Carisa, G.	Wy.		500,000	5	*		
25	Carupano, G. s. L. C.	Ven.		200,000	2	*		
26	Cashier, G. s.	Colo.		500,000	2	*		
27	Charles Dickens, G. s.	Idaho		1,250,000	5	*		
28	Cherokee, G.	Cal.		1,500,000	10			
29	Chollar, s.	Nev.		11,200,000	100	1,540,000	Nov.	1889
30	Cleveland, T.	Dak.		1,000,000	100	*		
31	Colchis.	N. M.		500,000	10			
32	Comstock, G. s.	Nev.		10,000,000	100	35,000	Mar.	1887
33	Con. Imperial, G. s.	Nev.		5,000,000	50	1,875,000	July.	1890
34	Con. Cal. Pacific, G.	Cal.		6,000,000	100	198,000	June	1890
35	Con. Silver, s.	Mo.		2,500,000	10			
36	Crescent, s. L.	Colo.		3,000,000	100	*		
37	Crocker, s.	Ariz.		10,000,000	100	150,000	June	1890
38	Crowell, G.	N. C.		500,000	1			
39	Dahlonega, G.	Ga.		250,000	1	*		
40	Dandy, s.	Colo.		5,000,000	100			
41	Decatur, C.	Colo.		1,500,000	5	*		
42	Denver City, s. L.	Colo.		5,000,000	10	*		
43	Denver Gold, G.	Colo.		300,000	5			
44	Durango, G.	Colo.		500,000	1	*		
45	Eastern Dev. Co., Lt.	N. S.		1,500,000	10	930,000	Mar.	1886
46	El Cristo, G. s.	U.S.C.		1,000,000	2			
47	El Dorado, G.	Cal.		1,000,000	4	*		
48	El Talento, G.	U.S.C.		1,000,000	2			
49	Empire, s.	Utah		10,000,000	100			
50	Eureka Tunnel, s. L.	Nev.		10,000,000	100	*		
51	Exchequer.	Nev.		10,000,000	100	865,000	July.	1890
52	Found Treasure, G. s.	Nev.		10,000,000	100	81,500	May.	1890
53	Gogebic I. Syn., L.	Wis.		5,000,000	200			
54	Gold Cup, s.	Colo.		500,000	25			
55	Golden Era, s.	Mont.		2,000,000	1	*		
56	Gold Placer, G.	Colo.		5,000,000	200			
57	Gold Rock, G.	Cal.		1,000,000	25	229,314	Dec.	1885
58	Goodshaw, G.	Cal.		10,000,000	100	*		
59	Grand Rapids.	Tex.		12,000,000	100			
60	Grand Duke.	Colo.		800,000	10			
61	Great Remance, G.	U.S.C.		1,000,000	2	*		
62	Gregory-Bobtail, G.	Colo.		550,000	1	*		
63	Gregory Con., G.	Mont.		3,000,000	10			
64	Harlem M. & M. Co., G.	Cal.		1,000,000	5			
65	Head Cent. & Tr., s. G.	Ariz.		10,000,000	100			
66	Hector, G.	Cal.		1,500,000	5	45,000	Jan.	1889
67	Highland, C.	Mich.		500,000	25			
68	Holywood.	Cal.		200,000	2			
69	Hortense, s.	Colo.		2,000,000	10			
70	Huron, C.	Mich.		1,000,000	25	280,000	May.	1887
71	Iron Gold & Silver, s.	Cal. M.		2,000,000	10	*		
72	Ironton, I.	Wis.		1,000,000	25			
73	Iroquois, s.	Mich.		1,250,000	25			
74	J. D. Reymert.	Ariz.		10,000,000	100			
75	Julia Con., G. s.	Nev.		11,000,000	100	1,463,000	Jan.	1889
76	Lacrosse, G.	Colo.		1,000,000	10	*		
77	Lee Basin, s. L.	Colo.		5,000,000	10	*		
78	Mayflower Gravel.	Cal.		1,000,000	10	585,000	Mar.	1890
79	Medora, G.	Dak.		250,000	1			
80	Mexican, G. s.	Nev.		10,000,000	100	2,791,960	Oct.	1890
81	Middle Bar, G.	Cal.		400,000	2	*		
82	Mike & Starr, s. L.	Colo.		1,000,000	5	*		
83	Mollie Gibson.	Colo.		2,000,000	10			
84	Monitor, G.	Colo.		100,000	1,000	*		
85	Mutual Mg. & Sm.	W'sh.		100,000	1	*		
86	Native, C.	Mich.		1,000,000	40,000	25		
87	Neath, G.	Colo.		1,000,000	100	10		
88	Nevada Queen, s.	Nev.		10,000,000	100	200,000	Oct.	1889
89	New Germany, G.	N. S.		100,000	1	*		
90	New Pittsburg, s. L.	Colo.		2,000,000	200	*		
91	N. Commonw'th, s.	Nev.		10,000,000	100	85,000	April	1890
92	North Standard, G.	Cal.		10,000,000	100	30,000	Nov.	
93	Noonday.	Cal.		600,000	60	208,000	Dec.	1881
94	Oneida Chief, G.	Cal.		500,000	125	*		
95	Oriental & Miller, s.	Nev.		10,000,000	400			
96	Osceola, G.	Nev.		5,000,000	500			
97	Overman, G. s.	Nev.		11,520,000	115	3,832,800	Dec.	1889
98	Park, s.	Utah		2,000,000	100			
99	Peer, s.	Ariz.		10,000,000	100	165,000	Oct.	1890
100	Peerless, s.	Ariz.		10,000,000	100	405,000	Oct.	1890
101	Phœnix.	Ariz.		500,000	500	*		
102	Phœnix, G. s.	Ariz.		5,000,000	200	*		
103	Phœnix Lead, s. L.	Colo.		100,000	100	*		
104	Pilgrim, G.	Cal.		600,000	2	*		
105	Potosi, s.	Nev.		11,200,000	112	1,573,000	Mar.	1890
106	Proustite, s.	Idaho		250,000	250	*		
107	Puritan, G.	Colo.		1,500,000	150	*		
108	Quincy.	Colo.		3,000,000	300			
109	Rappahannock, G. s.	Va.		250,000	250	*		
110	Red Elephant, s.	Colo.		500,000	500			
111	Ropes, G. s.	Mich.		2,000,000	80	147,300	July.	1887
112	Russell, G.	N. C.		1,500,000	300	*		
113	Sampson, G. s. L.	Utah.		10,000,000	100	288,157	July.	1888
114	San Sebastian, G.	San S.		1,600,000	320	*		
115	Santa Fe, C.	N. M.		5,000,000	500			
116	Santiago, G.	U.S.C.		400,000	200	*		
117	Security, G.	Colo.		10,000,000	100			
118	Sheridan.	N. M.		2,000,000	200			
119	Silver Queen, C.	Ariz.		5,000,000	200	*		
120	South Bulwer, G.	Cal.		10,000,000	100	100,000	May.	1881
121	South Hite.	Cal.		10,000,000	100	195,000	Jan.	1883
122	South Pacific.	Cal.		500,000	100			
123	Stanislaus, G.	Cal.	

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 7.		March 9.		March 10.		March 11.		March 12.		March 13.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams													
Alice							1.40	1.35	1.35		1.40	1.35	1000
Aspen, Colo.													
Atlantic, Mich													
Bassick, Colo											.07		100
Belcher, Nev													
Bos. & Mont., Mont													
Breece, Colo													
Bulwer, Cal													200
Caledonia													
Calumet & Hecla, Mich													
Catalpa, Colo													
Chrysolite, Colo									.20				200
Colorado Cen.,Con.Colo.											1.25		100
Cons. Cal. & Va., Nev			6.63	6.38	8.50	7.00	9.00	8.50	10.00	9.13	11.00	10.00	2,535
Crown Point, Nev	1.55						1.80						200
Deadwood, Dak													
Eureka Cons., Nev													
Excelsior, Cal													
Father de Smet													
Franklin													
Freeland, Colo			.15				.16	.15					700
Gould & Curry, Nev			2.30		2.50		2.55						300
Grand Prize, Nev													
Hale & Norcross, Nev											2.55		200
Holyoke, Idaho							.06				.03		300
Horn-Silver, Utah			3.15		3.25		3.20		3.30				587
Independence, Nev													
Iron Silver,Colo											1.20		100
Kearsarge													
Leadville C., Colo					.12		.12	.11	.11				4,100
Little Chief, Colo					.34								500
Mono, Cal											.60		100
Moulton, Mont													
Mt. Diablo, Nev													
Navajo, Nev													
N. Belle Isle, Nev													
Ontario, Utah							40.00						10
Ophir, Nev	4.60				4.10		4.50						300
Osceola, Mich													
Plymouth, Cal													
Quicksilver, Pref													
" Com													
Quincy, Mich													
Robinson Cons., Colo							.30		.35	.30			1,000
Savage	2.00				2.15	2.00			2.05				560
Sierra Nevada, Nev													
Silver Cord													
Silver King, Ariz			.05										100
Silver Mg. of L. V													
Small Hopes													
Standard									1.25				200
Stormont, Utah													
Tamarack, Mich													
Yellow Jacket, Nev	2.35				2.50								150

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 7.		March 9.		March 10.		March 11.		March 12.		March 13.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha, Nev													
Alta, Nev	.75		.70		.75		.80				.90		900
American Flag, Colo													
Andes, Nev													
Amador, Cal													
Astoria, Cal											.03		200
Belmont, Cal	.37	.36	.37		.37		.38	.37	.38		.39	.38	1,500
Best & Belcher, Nev	2.15				2.50								200
Bonanza King, Cal													
Brunswick, Cal	.13	.12	.12	.10	.12	.10	.12	.09	.12	.10	.12		14,400
Bullion													
Butte & Bost., Mont													
Castle Creek, Idaho													
Challar, Nev	2.00		2.00				2.50						300
Col. & Beaver, Idaho							.03						100
Commonwealth, Nev								.80					50
Comstock T., Nev			.16		.18	.16	.19	.17	.20	.18	.22	.21	39,000
" bonds							.39	.37	.40		.40		15,000
" scrip													
Con. Imperial, Nev													
Cons. Pacific, Cal													
Crescent, Colo													
Del Monte, Nev													
El Cristo, Rep. of Col			.50				.40						200
Exchequer													
Hollywood, Cal													
Huron, Mich													
Julia, Nev													
Justice, Nev													
King. & Pembroke													
Lacrosse, Colo											.07		1,000
Lee Basin, Colo													
Mexican, Nev	2.65		2.70		2.75								400
Middle Bar	.04		.04		.04		.04		.05	.03	.04	.03	7,400
Monitor, Colo													
Mutual Sm. & Mg. Co	1.40		1.40		1.45		1.45						1,000
Nevada Queen, Nev													
N. Commonwealth, Nev													
Occidental, Nev	.80		.90	.85	.90		1.00	.95	1.15				1,200
Oriental & Mil., Nev													
Overman, Nev													
Phœnix of Ariz			.40	.36	.35		.39	.31	.36	.35			3,800
Phœnix Lead, Colo													
Potosi	3.75						5.50						200
Rappahannock													
S. Sebastian							.10						200
Scorpion													
Seg Belcher, Nev													
Silver Queen													
Sullivan Con., Dak													
Sutro Tunnel, Nev	.10												2,000
Tioga, Cal													
Union Cons., Nev	2.50												
Utah, Nev	.75		.80		.90						3.00		150
											.90		1,100
											1.00		

*Ex dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 13,342. Non-dividend shares sold, 90,300.
¶ Holiday. Total, New York, 103,542.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	March 6.		March 7.		March 9.		March 10.		March 11.		March 12.		SALES.
Atlantic, Mich									15.50				50
Bodie, Cal													
Bonanza Development							.50						100
Bost. & Mont., Mont	41.25	40.75	41.00	40.00	41.25	40.38	41.25	40.00	42.25	41.00	41.75	41.00	4,220
Breece, Colo													
Calumet & Hecla, Mich	260		260		256				260¼	260			75
Catalpa, Colo									.25				500
Central, Mich													
Chrysolite Colo													
Con. Cal. & Va., Nev													
Dunkin, Colo									.60				100
Eureka, Nev													
Franklin, Mich					17.00								10
Honorine, Utah													
Horn Silver, Utah													
Kearsarge	13.50		13.00	12.88	13.25				13.00		13.25	13.00	270
Little Chief, Colo													
Little Pittsburg, Colo													
Moulton													
Napa, Cal													
Ontario, Utah													
Osceola, Mich	38.00	37.50	38.00	37.88	38.00	37.50	38.00		38.00	37.63	37.63	37.00	1,909
Quincy, Mich	99.00	98.25	100	99.00	100	99.00			100		100		580
Ridge, Mich	.55												500
Sierra Nevada, Nev													
Silver King													
Stormont, Utah													
Tamarack, Mich	145		145		145				150		150		31
Tecumseh, Mich													

NAME OF COMPANY.	March 6.		March 7.		March 9.		March 10.		March 11.		March 12.		SALES.
Allouez, Mich					3.50		3.00		3.00				370
Arnold, Mich													
Aztec, Mich													
Brunswick, Cal													
Butte & Boston, Mont					15.50		15.25				15.50	14.25	1,585
Centennial, Mich	17.50	16.75			16.00		16.75	16.00	16.25	16.00	16.00		496
Comstock, T., Nev													
Copper Falls Mg													
Crescent, Colo													
Dana, Mich													
Don Enrique, N. M													
El Cristo, S. A													
Hanover, Mich													
Humboldt, Mich													
Hungarian, Mich													
Huron, Mich													
Mesnard, Mich													
National, Mich													
Native, Mich													
Oriental & M., Nev													
Phœnix													
Pontiac													
Rappahannock, Va													
Santa Fe, N. Mex					.57½		.60		.60				300
Shoshone, Idaho													
South Side, Mich													
Star													
Washington, Mich													
Winthrop, Mich													

Boston: Dividend shares sold, 8,345. Non-dividend shares sold, 2,741. Total Boston, 11,086.

COAL STOCKS.

NAME OF COMPANY.	Par val. of shares.	March 7.		March 9.		March 10.		March 11.		March 12.		March 13.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal														
Cambria Iron														
Cameron Coal & I.Co														
Ches. & O. RR	100													
Chic. & Ind. Coal RR	100													
Do. pref	100													
Col. C. & I	100	35	34½	35⅝	35	36¼	35⅝	38	36¾	38⅞	37	38¾	38	5,360
Col. & Hocking C. I.	100			15										200
Consolidation Coal	100													
Del. & H. C	100	131½	129½	130⅛	129	130¾	130¼	132⅝	130¾			133	131	2,869
D., L. & W. RR	50	134¾	133¾	134⅝	133⅝	134¾	133	135	133¾	135½	134½	135½	133⅝	72,923
Hocking Valley	100			26½	25⅛							26⅞	26	310
Hunt. & Broad Top										21				100
Do. pref								43¾		43½				22
Illinois C. & Coke Co														
Lehigh C. & N	50	47½	46⅞	47¼	46½	46¼		46⅞	46½	46¾	46¼			2,374
Lehigh Valley RR	50	50½	50¼	50½	50¼	50¼	50⅛	§49⅞	49⅝	49⅝				730
Lehigh & Wilk. Coal	100													
Mahoning Coal	100													
Do. pref	100													
Maryland Coal														
Morris & Essex	100													
New Central Coal	50							10				10		2,200
N. J. C. RR	100	115	114	114	112¾	114⅝	113½	117	115½	117	115¾	116¾	113	2,610
N. Y. & S. Coal	100													
N. Y., Susq. & West	100	8½		8¾	8¼			8⅝	8¼	8¼	8	8¼		1,061
Do. pref	100					32		32¼	32	31¾	32⅜	32¾	32	1,220
N.Y. & Perry C. & I	100													
Norfolk & West. RR.	50	14½						14		13⅜		14		350
Do. pref	50	53						53½		53⅜		52½		135
Penn. Coal	50													
Penn. RR	50	51¼	51	51⅛	50⅞	51⅛	50⅞	51⅛	51	51⅛	51			3,923
Ph. & R. RR		30	29¼	29⅞	28⅝	29⅛	28⅝	29⅝	29	30⅛	30	31	29½	**51,255
Sunday Creek Coal														
Do. pref	100													
Tennessee C. & I. Co		34½	34¼	34¾	33	34¾		35¾	35			35¼	35	2,870
Do. pref														
Westmoreland Coal														

§Ex-dividend, **Sales in New York, 21,795; in Philadelphia, 29,460. Total sales, 149,093.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	Mar. 6.	Mar. 7.	Mar. 9.	Mar. 10.	Mar. 11.	Mar. 12.
Alpha						
Alta	.65		.65	.70	.75	.80
Belcher						
Belle Isle	.60		.60	.60	.60	.65
Best & Bel	2.05		4.45	3.75	4.55	5.13
Bodie	1.05		1.10	1.10	1.10	1.00
Bulwer	.35		.45	.40	.30	.40
Challar	1.90		2.05	2.35	2.35	2.75
Com'wealth			.70	.70	.75	.70
Con. C. & V	6.55		6.37	9.00	10.00	11.88
Con. Pacific						
Crown Point	1.40		1.50	1.65	1.60	2.10
Del M'te,Nev						
Eureka C	3.40		3.40			
Gould & C			2.35	2.40	2.50	1.90
Hale & N			1.90	2.00	2.00	2.35
M. White						
Mexican	2.50		1.65	2.75	2.90	3.35
Mono	.55		.60	.60	.60	.50
Mt. Diablo	.55					
Navajo			.15	.20		.20
Nev. Queen			.15	.20	.20	.20
N. Belle Isle	.50		.50	.55	.75	.60
N.Com'w'lth						
Ophir	3.50		3.75	4.30	4.10	5.13
Potosi	4.40		4.70	5.25	5.00	6.68
Savage	1.85		2.00	2.00	2.00	2.30
Sierra Nev	2.20				2.65	2.80
Union Con	2.35		2.40	2.55	2.80	3.10
Utah	.65		.80	.80	.80	.90
Yellow Jak	2.20		2.35	2.45	2.40	2.80

no doubt that there is a good deal of business to be done, but in the lack of strong inducements to immediate action not much is done at present.

Steel Rails.—A better feeling prevails among steel-rail makers this week for causes well known. Quotations are given strong at $30. Nearly all the business done is in small lots. Opinions are quite different as to the probable magnitude of this year's demand.

Old Rails.—Old rails are inactive.

Scrap.—Very little scrap has been selling since Monday. There is no change in prices.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 13.

Business during the week has not been all that was expected Consumers all over the country have been holding back in the hope that pressure would eventually cause a decline in values. As a consequence, there has been but little business, and while the stocks in some cases have not grown burdensome, the quantities here would seem to justify such expectations. If it were not for the exceptionally strong position of the Alkali Union abroad, prices could not be maintained; but as the market there is firm, dealers think the tone of this market will be much improved in the near future. There are quite a number of consumers who have practically no stock, and it is believed they will soon be in the market, as buyers, thus relieving the situation. In the meantime the arrivals have been large, especially those of caustic soda, and although a large part of that which came in was on contract, there still remains a goodly portion which has been thrown on the market. With reference to the lighter chemicals, brimstone has continued daily to become more valuable. The prices of nitrate of soda has remained stationary on the arrival of a large shipment during the week, but now they have again started on their upward course.

Caustic Soda, 60%.—The position of caustic soda, 60%, is decidedly weaker than it was a week ago. Arrivals have been quite large, while the demand remains very light. Prices have experienced a slight decline. We quote 3·30@3·32½c. The expectation that the non-support of the union abroad by the public would cause a decided weakening in values was quite general. The reaction, on finding that the subscriptions were generous, was perfectly natural and quite sharp. As a consequence, the market abroad is stronger than it has been in some time, and this feeling will doubtless prevail here, as soon as part of the stock, which is at present holding it down, has been worked off. 70-74%.—Arrivals have been very large, amounting to over 3,000 dms. A fair amount of inquiry, sometimes resulting in business, has been noted. Spot is quoted much lower, than business to arrive could be done for. In fair lots for immediate delivery 3·05@3·07½c. can be quoted, with some sales a little lower, while orders for shipment could not be placed at less than 3·10@3·15c. 77%.—This has come in quite freely, and the demand has not been very large, so that its present position is not quite as strong as it has been. We quote 3·07½@3·10c.

Alkali, 48%.—This has met with a better demand during the week than heretofore. Arrivals have been quite large, but most of that which came in was on contract. Prices range from 1·60@1·65c. 58% has found a good market at 1·50@1·55c., with some makes selling as low as 1·47½c. The stocks are not large, and the tone of the market is quite healthy.

Caustic Soda Ash 48%.—The demand has been very small, and the stocks are carefully kept proportioned to the demand, so that no great weakening in values is noticeable; but business is almost nominal, and there does not seem to be any immediate prospect of a change. Some orders in a jobbing way have been filled at 1·50c.

Carbonated Soda Ash, 48%.—Most of the business has been on contract, all arrivals going immediately into second hands, so that the market is at present almost bare. Demand continues most satisfactory, and leaves values firmer than at the time of our last report, though no appreciable increase is noted. We quote 1·60@1·65c. High test has met with a good demand. Sales of large lots, contracts for shipment and business in a jobbing way have all been done at figures from 1·50@1·62½c., according to quantity, etc.

Sal Soda.—The market is a little weaker than it was. Large orders could now doubtless be placed at 1·05c., with a falling off noted in the demands for job lots. Stocks here are not said to be large, but the competition of the domestic makers makes a difference in the ability of dealers to get what they want. Domestic has changed hands freely at from 1@1·05c., and dealers look forward to continued good business with confidence.

Bleaching Powder.—Under continued large arrivals bleaching powder has experienced a decline in value. Demand is said to be small, with business mostly of a jobbing nature. Large lots could probably be bought at 1·62½c.; smaller lots are quoted at from 1·70@1·72½c.

Acids.—Dealers seem rather well satisfied with their recent decision to hold out for higher prices. The continued rise in raw materials had made this a matter of necessity and has not influenced individual business to any great extent. Contracts continue to be met, and the periodical buyers well realize the justice of the recent increase in values. Some large sales of acetic have been reported. Muriatic and nitric are selling in limited quantities at figures ruling slightly higher than our last quotations. We quote acid per 100 pounds in New York and vicinity:

Acetic, $1.55@$2; muriatic, 18°, 80c.@$1; muriatic, 20°, 90c.@$1.10; muriatic, 22°, $1@$1.20; nitric, 40°, $3.75@$4.25; nitric, 42°, $4.00@$4.50; sulphuric, 60°, 95c.@$1.15; sulphuric, 66°, $1.12½@$1.62½.

Fertilizers.—With approaching spring this business always shows new life, and this year has proved no exception to the rule. In almost every line sales of some magnitude are spoken of with satisfaction, and the more general use of fertilizers all over the country cannot fail to add to the tone of the market. Add to this the exceptional position of brimstone and nitrate of soda, and all conditions are most favorable to the good business which has resulted.

Large contracts for phosphate rock are being filled and a good general trade is noted. The demand shows every sign of a healthy increase, and continued inquiry gives promise of future large transactions. Charleston rock f.o.b. is quoted at $7.25@$7.50; freights by sail from Charleston to New York, $1.75@$2. Ground rock is held at from $8 to $11 50 per ton.

Sulphate of Ammonia has arrived in some quantity and changed hands quite freely. Gas liquor is offered at 3·17½c., and April, May shipments are selling at from 3·20@3·25c. Bone sulphate has been sold in some quantity at 3·12½c., though, according to latest reports, indications pointed toward a stiffening in values.

Nitrate of Soda.—The wretched condition of the means of communication between this country and Chili leaves the public at sea as to the precise condition of affairs on the coast, and most dealers seem to depend for immediate information on current newspaper reports, so that the position of nitrate always leaves some room for doubt. The Argyle came in, day before yesterday, with a cargo which was, of course, immediately absorbed by the market. The next shipment is expected to arrive during the latter part of the month, and consists of 16,000 bags. Spot nitrate is held at from 2·22½@2·25c.; to arrive, 2·12½@2·17½c. When it is considered that the total visible supply up to July 1 is only 237,000 bags, while during the corresponding period last year, the consumption amounted to 264,000 bags, the present position of the market must be considered very strong, although the large supply in Europe, to which reference has previously been made in this column, has continued as a kind of menace and probably prevented any unreasonable rise in values here. No reports are at hand from which it can be inferred that ships are loading at Pisagua or any other ports; in fact, quite the contrary is generally considered to be the case.

Brimstone.—The corner which has caused the recent rise in prices continues as powerful, as heretofore. The shipments have been very light, arrivals at all ports probably not aggregating more than 7,600 tons. At present, best unmixed seconds are held at $35 for spot and $34.50 to arrive, April and May shipments; thirds are quoted $1.50 lower. Every indication seems to point toward a further rise. The producers in Sicily seem well backed, and production is reported to have been further restricted.

Muriate of Potash.—Sales of spot keep pace with the arrivals, almost all of which are under contract. Inquiry continues and contracts for future shipments are continually being placed. The arrivals during the week amounted to 350 tons, all of which went into immediate consumption. Further sales of 300 tons are reported. The prices remain, as already quoted, with the additional charge of 5 cents due to ice.

Saltpetre.—Messrs. H. H. Crocker & Co., in their monthly circular under date of March 1st, report the present condition of the saltpetre trade as follows:

Saltpetre.	1891, bags.*	1890, bags.*	1889, bags.*
Imported into the United States from Jan. 1, to date.	14,586	9,454	4,859
On the way for the United States by mail, to Jan. 28.	15 005	13,687	16,121
On the way for the United States, by cable, Feb. 28.	5,750	4,000	5,500
Stock in importers and speculators' hands in Boston, Feb. 28.....	None.	None.	None.
Stocks in importers and speculators' hands in New York, Feb. 28.....	16,000	7,500	6,890
Supply for four months.....	36,755	25.187	28.421
Stock on hand Jan. 1.....	11,000	5,500	7,750
Deliveries since Jan. 1, New York and Boston.....	9.586	7,454	5,809
Deliveries past 30 days.....	3,019	2,062	4,331
Deliveries for consumption for years	.....	62,263	52,073
Prices current, Feb. 28, per pound.....	3¾@4¼c.	4¾@5¾c.	4⅝@5⅝c.

*Spot and deliveries.

Market during the month has been very quiet, with only a spot jobbing business doing. No business in shipments.

Liverpool. Feb. 28.

(Special Correspondence by G. G. Blackwell.)

Minerals.—There is no change to report in our market this week, which continues firm, with a fair amount of business doing at full prices. Manganese: Arrivals have somewhat improved; prices are unaltered, with an upward tendency. Magnesite: Stocks of raw lump undiminished at nominal figures. Raw ground £6 10s., and calcined £12 10s. Bauxite (Irish Hill brand): In increased demand at tip-top figures, with a disposition to advance. Pumicestone: In lump and ground more doing. Iron ore continues quiet, also maganiferous and Santander; Irish and Cumberland in good demand at full prices. Emery stone: Steady business doing for best qualities; No. 1 lump, £5 10s.@£6; smalls, £5@£5 10s. Fullers' earth unchanged; best lump, 55s.; fine impalpable ground, £7; "Emerald" ground, 8?s. Scheelite, wolfram, tungstate of soda and tungsten metal firmer. Chrome ore: There is more movement in higher grades; lower qualities dull Antimony ore and metal steady. Asbestos firm, especially Canadian Rock. Calamine: High qualities sought after at full figures. Strontia sulphate (celestine) steady, 15s. 6d. to 17s. Carbonate (native), £15 to £16; powdered (manufactured), £11 to £12. Limespar in more demand; English manufactured old G.G.B. brand, in request at 50s. (ground). Felspar and fluorspar firmer. Ground mica, £50. China clay steady; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Irish moss rather dull. Bog ore (oxide of iron) steady; finest quality 22s.

Chemicals.—Our market has maintained the steadiness last reported. Soda ash, 1⅜d. up. Caustic soda firm; 60% white, £10; 60% cream, £9 12s. 6d.; and 70% white, £11 10s.; 74%, £12. Bicarbonate, £5 15s. Nitrate of soda, 8s. 6d. to 9s. Soda crystals, £3 10s. Bleaching powder, £7 2s. 6d. Salt cake, 45s. Chlorate of potash, 5½d. Arsenic strong at £14. Sulphate of copper, £18 10s. to £19. Manganese sulphate, £22; cloride of manganese, £15 per ton; carbonate, £12 10s.; borate, best English make, 6½d. Oxalate, 1s. 6d. Chloride of magnesium (antiseptic) strong at 45s. to 50s.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, March 13.

The two or three fine days in the early part of the week were characterized by some business, which stands out in strong contrast to the inactivity of the last two days. Unfortunately, the manufacturers generally have sent such large quantities to the city that it would need a large continued demand to get rid of present stocks. If it were not for that fact prices would now doubtless be much higher, as dealings, in bricks particularly were quite extensive.

Bricks.—The arrivals of almost every grade have been large, making any rise in prices impossible. The general tone of the market is weak and the demand for immediate delivery very small. It is understood that the meeting of brick manufacturers recently held at the Astor House was not so much a combination to have any effect on production or cost as a protective association against the demands of the labor unions, which have been so exacting during the last few years as to make business almost impossible. Haverstraws are freely offered at $5.50 per M. and extra fine lots a little higher. Pale are selling at from $2.50@$3.00 and Jerseys at $4.50.

Lime —Dealers have not been able to maintain the high prices of the last fortnight. The higher figures paid for lime so stimulated production that a very short time demonstrated the impossibility of their continuance. As a matter of fact some kilns have been started and have been put out again. The stocks here are large; limited quantities are coming in right along, by vessel. The demand is fair, and sales are being made at $1 for Rockland lime, both common and finishing.

NOTES OF THE WEEK.

Charles Siedler, receiver of the Lorillard Brick Works Company in Keyport, made application to Chancellor McGill, in Jersey City, during the week for permission to continue the business and to issue $100,000 in receiver's certificates, which will be a first lien on the property. Mr. Siedler's counsel represented to the Chancellor that the works are in good order and able to pay large dividends if properly managed. A business can be done sufficient to bring in $100,000 profit annually. None of the creditors were represented in court, although all of them had been notified that the application would be made. The Chancellor decided to wait before giving a decision until a creditor, who is in Europe and has not yet given his consent, can be heard from.

Mining Stocks
BOUGHT AND SOLD
For Cash or on Margin in New York and San Francisco.
A. R. CHISOLM & CO.,
61 BROADWAY,
(ESTABLISHED 1876.) NEW YORK.